The Effectiveness of Employee Assistance Program Counseling on Depression, Alcohol Misuse, Work Absenteeism and Work Productivity Outcomes: Four Single-Group Longitudinal Studies of Archival Data in the United States 2017-2021

Mark Attridge

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Mark Attridge[1] MA, PhD

[1]Attridge Consulting, Inc. Minneapolis US

Corresponding Author:
Mark Attridge MA, PhD
Attridge Consulting, Inc.
1129 Cedar Lake Rd S
Minneapolis
US

Abstract

Background: This paper presents empirical findings from a multi-year applied real-world evaluation study conducted at a commercial employee assistance program in the United States.

Objective: To test for changes in clinical and work outcomes after counseling and explore possible moderator effects for client, clinical and COVID-19 pandemic factors.

Methods: Self-report outcomes assessed with standardized measures were collected at the start of counseling from 23,572 employees during the normal course of business at CuraLinc Healthcare from 2017 to June 2021. A total of 4,017 employees had valid Pre and 30-day Post use data on one or more of the outcomes. Four longitudinal samples were examined based on the outcome, including depression outcomes on the Patient Health Questionnaire (PHQ-9; n=346/2,555); alcohol misuse outcomes on the Alcohol Use Disorders Identification Test (AUDIT-10; (n=313/1,690); hours of work absence outcomes on the Workplace Outcome Suite (n=2,925/20,992); and work productivity outcomes) on the Stanford Presenteeism Scale (n=3,013/20,211). Tests indicated the longitudinal samples were each a fair representation of the larger groups that only had outcome data at the start of counseling.

Results: Tests with each outcome found significant improvement after counseling (all P<.001) with large statistical effect sizes (partial eta squared). The average level of depression symptoms was reduced by 58% (eta2=0.63). Among cases at-risk with depression disorder, 86% had a reliable clinical improvement in reducing symptom severity. The average level of alcohol misuse was reduced by 64% (eta2=0.67) Among cases at-risk with alcohol misuse, 71% had a reliable clinical improvement in reducing symptom severity. Average hours of work absence in the past month were reduced by 79% (eta2=0.24). The level of work productivity improved by 35% (eta2=0.48). Moderator tests indicated the improvement was generally consistent across different sub-groups of clients based on age, gender, clinical use characteristics and other study context factors. Some differences were found with the primary clinical issue matching the outcome, with alcohol and men, as well as some differences by formal referral into counseling (versus the more common self-referral type). Comparison of the pre-pandemic years to the period during the COVID-19 pandemic revealed very similar improvement in all four outcomes for groups of in-person sessions pre-pandemic, in-person sessions during the pandemic and online video sessions during the pandemic. Also, 95.2% (19,269/20,245) of employees were satisfied with their service use experience during the same time frame as the outcome study.

Conclusions: Providing effective brief counseling from a high-quality employee assistance program is one way companies can support employees with depression or alcohol issues. Work impairments in missed work and lost productivity associated with a wide range of behavioral health, family, personal and work issues can also be restored after the use of brief counseling. Limitations of the study design and future directions are also discussed. Clinical Trial: N/A

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Introduction

Mental Health Disorders and the Workplace

As discussed in a recently published article in the *Harvard Business Review* [1], employers are concerned about mental health and substance abuse issues both from the personal perspective of caring for their workers and from the standpoint of organizational productivity and cost. Driving this concern are the high prevalence rates for behavioral health disorders among working populations [2]. For the United States, in normal times, epidemiological data on prevalence rates indicate that about 1 in every 5 working adults have diagnosable mental health disorders and/or substance abuse problems [3], a rate that is even higher when examining the full population and not just the employed (typically healthier) segment. The 2018 National Survey on Drug Use and Health found that 23.2% of a sample of over 68,000 adults had a mental disorder (such as depression or anxiety), a substance use disorder or both [4].

Behavioral health issues have been exacerbated during the COVID-19 global pandemic. Indeed, some business leaders have called mental health in the workplace "the coming revolution" [5]. Results of the National Health Interview Survey and the U.S. Census Bureau [6] showed that in the first half of 2019 (before the pandemic) about 1 in every 10 Americans reported symptoms of depression or anxiety, but that after the pandemic had taken hold this rate increased fourfold in January of 2021 (i.e., 11% *vs*. 41%). Other large-scale studies have found similar dramatic increases in the prevalence rates for mental health and substance use disorders in the United States [7] and many other countries globally [8].

Mental health and alcohol use problems usually do not get better on their own [9]. The consequences of leaving these issues untreated have a far-reaching impact on both physical and emotional fitness [9,10]. Depression is among the most burdensome of behavioral health disorders, giving rise to considerable adverse effects on activities of daily living and work functioning [11]. Stress and other behavioral health issues are also deeply disruptive for the individuals experiencing them, as well as their friends, family and co-workers. Numerous studies have demonstrated that depression and other mental health conditions are associated with increased overall health care costs [12,13].

There is also evidence that chronic depression [14] and other common behavioral health risk factors are associated with deficits in employee absenteeism and work presenteeism [15-17]. Behavioral health issues are associated with work presenteeism more strongly than with work absenteeism [18,19]. Past research shows that improvements in employee health tend to co-occur with improvements in work productivity and reduced work absence [20]. Therefore, it makes sense for employers to try to prevent or reduce the rates of depression, alcohol misuse and other common behavioral health conditions among employees and family members. Many organizations sponsor employee assistance programs (EAPs) to support these goals.

Employee Assistance Programs

According to the Employee Assistance Professionals Association (EAPA) [21], an EAP is a "set of professional services specifically designed to improve and/or maintain the productivity and healthy functioning of the workplace (p. 1)." As Attridge described at the 2021 Work, Stress, and Health Virtual Conference that was co-sponsored by NIOSH and the American Psychological Association, the research literature indicates that employee assistance programs can help improve the mental

well-being and productivity of workers [22]. Recent surveys of the memberships of major human resources [23] and employe benefits [24] organizations also find most U.S. employers sponsor an EAP. Data from the most recent national random sample study in the United States [25] indicated that most employers have an EAP, but it varies by size of the company and market sector. 29% of companies with 1-49 workers have an EAP; 49% with 50-99 workers; 68% with 100-499 workers; and 84% with 500 or more workers. The same pattern exists for employees of state and local government organizations: 61% of public sector organizations with 1-49 workers have an EAP; 68% with 50-99 workers; 70% with 100-499 workers, and 90% with 500 or more workers. This equates to over 2.3 million private sector employers and over 182,000 public sector organizations in America that sponsor an EAP benefit for their employees.

The use of EAP is also growing in many other countries around the world [2]. A 2016 survey identified a total of 839 external vendors of EAP services globally, with approximately 70% based in the United States and another 250 different providers operating in other countries [26]. For example, EAPs are a vital part of the world-leading initiative of the National Mental Health Commission in Canada to establish voluntary standards for businesses and organizations to create psychologically safe and healthy workplaces [27]. Many counties in Europe also have full-service EAP vendors, including Belguim, Canada [28], England, France [29], Germany [30,31], Greece [32], Italy [33] and Portgual, among others. The United Kingdom branch of the industry professional organization EAPA has been active since 1998.

Depression and other mental health problems are typically among the most common reasons why employees use brief counseling from EAPs. Although the number of cases seeking support for alcohol issues is a small part of overall case-mix, the full-service EAP approach has a long history of understanding how to identify and address employee alcohol problems by using the power of the workplace [34,35]. Identifying and supporting employees with alcohol problems is even specified as one of the seven "core technologies" that define the EAP profession [36].

The general effectiveness of employee assistance counseling has been established over the last 30 years. The conclusion from reviews of the applied research done to evaluate EAP services is that counseling from EAPs is effective for most users for reducing clinical distress and for improving work-related outcomes and that most users are satisfied with the counseling experience [37-39]. EAPs also support the larger goals of many employers around workplace mental health strategies and creating a healthy work culture. Mental health in the workplace is one of the emerging priorities of the current Total Worker Health$^{®}$ approach to health management [40]. According to the National Institute for Occupational Safety and Health [41]: "Mental health is a crucial part of worker well-being. Ensuring a psychosocially safe and healthy workplace is key to a *Total Worker Health* approach" (p. 1).

Since early 2020 when the COVID-19 global pandemic started, the EAP industry has responded by expanding the delivery of counseling services using digital and remote technology options [42,43]. The traditional emphasis on face-to-face interactions between the employee and counselor in an office shifted to include reliance on technology-driven modalities of service delivery. This modality change coincided with most EAPs also experiencing higher utilization rates (up by almost 30%), going from 7 out of every 100 employees in 2019 who used the EAP for counseling to almost 10 out of every 100 employees in 2021 [24,44]. During this time, the average number of counseling sessions used per case climbed by 38%, rising from 4.0 to 5.5 from 2019 to 2021 [44].

Project Overview

CuraLinc Healthcare is a global external vendor of EAP services that is based in the United States. In business since 2008, it has over 2,800 employer customers that offer the EAP as a benefit to over 4 million employees. This company specializes in delivering transformative mental health care by marrying technology and personalized advocacy to engage, empower and support employees throughout their care journey. The intake clinicians, also referred to as Care Advocates, were all independently-licensed, masters or doctorate level educated mental health professionals. During the initial assessment, these clinicians conduct thorough clinical assessments, make expert referrals and collect study outcome data when relevant. The clinicians also provide consultative follow-ups on all EAP cases. Like many other EAPs, in the CuraLinc Healthcare overall book of business data, the average number of clinical sessions per EAP case also increased from the period before the pandemic to during the pandemic, from 4.8 to 6.1 sessions, respectively.

Client satisfaction is a simple metric for assessing the impact of the EAP on users of the service. In addition to health and productivity outcomes, as part of its ongoing business practice, CuraLinc Healthcare also routinely collected anonymous survey data at 30-day post use follow-up to assess user satisfaction and other aspects of quality of service. For the satisfaction goal, employees were asked: "Overall, how would you rate your experience using the program?" with the response options of: *Excellent, Very Good, Good, Fair* or *Poor*. Over the past five years a combined sample of over 20,000 users of the EAP provided this feedback. When combining the top three rating options into one category of satisfaction, the results for each year were:

- Year 2017 = 95.0% (1551/1633)
- Year 2018 = 95.1% (3167/3330)
- Year 2019 = 95.1% (4809/5057)
- Year 2020 = 95.3% (6973/7317)
- Year 2021 January to June = 95.0% (2763/2908)
- All Years Combined = 95.2% (19269/20245)

This data shows positive results have been consistently obtained each year. Also important, the same level of client satisfaction was maintained from the COVID-19 pre-pandemic period and during the years of the pandemic: years 2017 to 2019: 95.1% (9527/10020) and years 2020 to 2021: 95.2% (9763/10225), respectively. User satisfaction is an important metric for assessing the impact of the EAP on employees who use the service. Other more rigorous methods of examining the effectiveness of the service also were implemented during this same period that featured a longitudinal design and use of research-validated self-report measures for clinical and work-related outcomes.

This article presents findings from a multi-year applied naturalistic study using longitudinal national data that focused on changes in employee depression, alcohol misuse and work outcomes after using an employee assistance program (EAP) in the United States. The effectiveness of the service was examined using a Pre-Post longitudinal design and research-validated self-report measures for clinical and work-related outcomes. The service delivery (counseling intervention) and measurement processes were part of the normal course of business. The clinical element of the research project

focused on evaluating the impact of brief counseling treatment on two of the common behavioral health issues affecting workers (depression and alcohol misuse). The workplace element focused on the outcomes of absenteeism and productivity as experienced among employees who used the EAP for any issue (not just for depression or alcohol misuse). The case-level data from four recent annual white paper reports of preliminary findings from this ongoing evaluation project [45-48] was aggregated into one master dataset and then re-analyzed for the present study. Across the four outcomes examined, valid longitudinal data was available from over 4,000 employees who worked at over 500 different employers in the United States. This time span also included periods before and during the coronavirus (COVID-19) pandemic.

Hypotheses and Research Questions

Given the results in past literature on evaluating the effectiveness of brief counseling from an EAP, positive changes in both the clinical and work kinds of outcomes after use of counseling were expected in this study. Thus, the following four research hypotheses were proposed:

H1: Among cases who used the EAP for a depression issue, the severity level of depression symptoms will be reduced from Pre to Post use of the service.

H2: Among cases who used the EAP for an alcohol issue, the severity of symptoms of alcohol misuse will be reduced from Pre to Post use of the service.

H3: Among all cases who used the EAP for any reason and reported on their work absenteeism, the number of hours of missed work will be reduced from Pre to Post use of the service.

H4: Among all cases who used the EAP for any reason and reported on their work productivity, the level of productivity will be improved from Pre to Post use of the service.

We also wanted to empirically answer the following research questions:

RQ1: Is improvement in outcomes from Pre to Post use of the counseling service different among subgroups of users based on client demographic, clinical use or study context factors (i.e., moderator tests)?

RQ2: Is improvement in outcomes from Pre to Post use of the counseling service similar for cases using the service in the time periods of before and during the COVID-19 pandemic?

Methods

Archival Data

The outcome data for the study were from employee users of the EAP service from CuraLinc Healthcare. We focused only on employee users in this study and the experiences of spouses, dependents and retirees of covered employees who used the EAP service were excluded. Users were made aware of the service as a benefit open to all covered employees through a variety of digital, interpersonal and workplace promotional practices. There was no direct cost to the employees in this study, as access to the EAP was sponsored by their employer. Employees participated voluntarily and were not paid for using the services. The study period spanned a total of 54 months, from the start of January of 2017 through the end of June of 2021 (see Figure 1). The year of use for each

case was defined by date of when the employee first contacted the program and completed the initial intake assessment. The last case included in the study had their Post use survey data completed in September of 2021.

Figure 1: Timing of data collection by year and business quarter with COVID-19 pandemic highlighted in gray.

Year	Quarter:			
	Q1	Q2	Q3	Q4
2017	●	●	●	●
2018	●	●	●	●
2019	●	●	●	●
2020	●	●	●	●
2021	●	●	○	○
Total				

Note: COVID-19 pandemic started March of 2020 (in grey background).
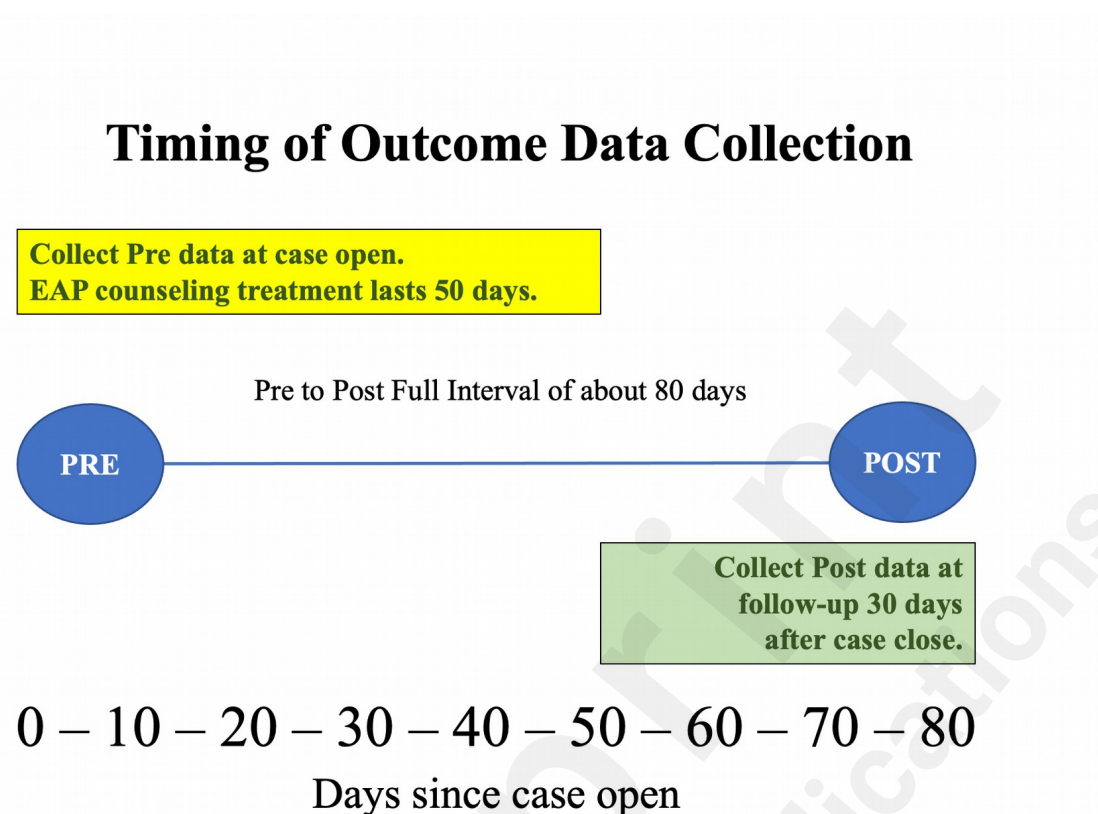
○ = no data

● = yes data collected

Counseling Intake, Intervention and Follow-up

Employees accessed the EAP in a variety of ways, most commonly by calling the EAP and speaking on the telephone with a Care Advocate. All Care Advocates are licensed mental health professionals. After the initial assessment, each employee was provided a referral to engage with a licensed mental health clinician for short-term counseling. As per the CuraLinc clinical model, every employee who requested support was referred to a clinician with a specialty that matched their presenting issue or concern and who also had confirmed appointment availability. Most of the counseling was delivered either in face-to-face sessions at the counselor's office or remotely via live video over the internet.

During the initial assessment, the outcome measure(s) were collected, either over the telephone or from completing a brief online survey. After the counseling treatment phase was completed, a Care Advocate conducted individual follow-ups with cases about 30 days after the last clinical session to assess the employees' clinical progress, use of any recommended additional support services and to determine if any other referrals were needed. At this point, the relevant study outcome measure(s) second wave of data was collected either over the telephone or online survey. In all cases, the counselor who treated the employee was not the same counselor who was involved in collecting the outcome data. The typical case participated in the counseling over a 50-day treatment period (i.e., from date of case open to case close) with the follow-up survey done at approximately 30 days later after the final clinical session (see Figure 2).

Figure 2. Timing of outcome data collection.

Timing of Outcome Data Collection

Collect Pre data at case open.
EAP counseling treatment lasts 50 days.

Pre to Post Full Interval of about 80 days

PRE   POST

Collect Post data at
follow-up 30 days
after case close.

0 – 10 – 20 – 30 – 40 – 50 – 60 – 70 – 80

Days since case open

Operational System Data

The first kind of data came from the operational business processes used by the staff and counselors who provide the counseling services. Part of this process involves recording core aspects of the business customer context, employee demographics and the clinical experience. For this study, we extracted the following information from the operational data system: name of employer/customer, maximum clinical sessions allowed per case in the employer/customer contract, date of first use of the service, date of follow-up survey (only available for cases with the work absenteeism outcome), employee age (date of birth), employee gender, source of referral to the EAP (self or formal referral from management), primary clinical issue (alcohol, depression, marriage, work and so on) and the clinical modality (how the counseling was delivered). The measure of the maximum number of sessions of counseling allowed per case (from the business contract with the employer sponsor of the EAP) that was linked to each case based on their employer is not the same as having case-level data on the actual number of sessions of counseling used by each case. Thus, this aspect of the clinical use experience could not be properly tested. However, it is included for descriptive purposes.

Self-Report Outcomes Data

Clinical symptom outcome data was collected at Pre for cases that had a relevant clinical issue (i.e., the case had either depression or alcohol as a primary or secondary issue as the reason for using the EAP). Work outcome data at Pre was collected for cases regardless of clinical issue. Not all EAP users completed the work outcome measures and not all relevant EAP cases with depression or alcohol issues were invited to complete the depression or alcohol clinical symptom measure. This

was because many employees had limited time available at the intake session for data collection or were not interested in engaging in the outcome measurement process. The business needs and the unique individual preferences of the employees and/or the intake Care Advocates ultimately determined which specific EAP counseling cases participated in the outcomes study data collection efforts. The Post use data was collected routinely through a follow-up survey at about 30 days after the end of the final counseling session for the specific cases that had the same outcome(s) collected at the start of the program use.

Outcome Measures

Standardized measures of clinical symptoms and work outcomes were assessed using published and validated scales from the scientific literature and available in the public domain.

Depression

Depression was measured for employees who presented with depression during the initial assessment as either their primary or secondary issue. The Patient Health Questionnaire 9-item scale (PHQ-9) [49] was used for screening, diagnosing, monitoring and measuring the severity of depression. This scale has been used in many research studies and has established validity and reliability [50-52]. Since its release in year 2001, the PHQ has been cited in over 24,000 scientific papers (according to Google Scholar, November 2021). The instructions state: "Over the last 2 weeks, how often have you been bothered by any of the following problems?" It has four response options of: (0) *Not at all*; (1) *Several days*; (2) *More than half the days*; and (3) *Nearly every day*. The PHQ-9 is scored by adding together the scores for all 9 items. Higher scores on this measure indicate greater depression. Scores are categorized into five levels of severity: Minimal=0 to 4; Mild=5 to 9; Moderate=10 to 14; Moderately Severe=15 to 19; and Severe=20-27. Based on recent reviews [53,54] clinical at-risk status for depression was categorized as Moderate or above (i.e., scores of 10+). This scale had excellent psychometrics with high internal consistency at both time points (α=.83 Pre; .91 Post) and a significant test-retest correlation (r_{paired}=.54).

Alcohol Misuse

Developed by the World Health Organization, the Alcohol Use Disorders Identification Test, 10-item full scale second version (AUDIT-10) was used to assess level of alcohol misuse and risky drinking behavior. First developed in 1989 for use in a primary care setting, the AUDIT-10 is now used in a wide variety of clinical and research settings as a brief screening tool for identifying at-risk alcohol consumption. The second version of the AUDIT, released in 2001 [55] has been cited in over 9,100 scientific papers (according to Google Scholar, November 2021). It measures three content domains: hazardous alcohol use (items 1-3); symptoms of alcohol dependence (items 4-6); and harmful alcohol use (items 7-10). The responses are on a 5-point scale for items 1 through 8 (scored as 0, 1, 2, 3 or 4) and a 3-point scale for items 9 and 10 (scored as 0, 2 or 4). The AUDIT-10 is scored by adding together the scores for all 10 items. Higher scores on this measure indicate greater alcohol misuse. It has four levels of risk for alcohol misuse: Low risk 0-7; Risky use 8-15; Harmful use 16-19; and Severe use 20-40. "At-risk" clinical status is defined as a score of 8 or higher. Items 4 to 10 refer to experiences "in the last year". At Pre the original items and responses were used, but at the Post, these items were changed where appropriate to be "in the last 30-days." This scale had excellent psychometrics with high internal consistency at both time points (α=.87 Pre; .84 Post) and a significant test-retest correlation (r_{paired}=.57). A minor methodological issue concerned the 12-month vs. the 30-day reference periods for the alcohol outcome measure at the Pre and Post periods. The response options, though, for 8 of the 10 items had 4 of the 5 choices with time frames reflecting monthly or less frequent rates of experience. In addition, our data revealed that very few responses were in the less than monthly final option on this scale, which makes the differences in response time

frame for Pre and Post far less relevant.

Work Absenteeism

The Workplace Outcome Suite (WOS) is a psychometrically-tested and validated five-scale questionnaire, developed by Chestnut Global Partners [56]. The WOS was designed to provide assessment on relevant individual differences that focus on five outcomes which are related specifically to EAP interventions and are likely to change across time if treatment is successful – and remain static if it is not. Of the five outcomes assessed by the WOS, only the absenteeism scale was used in this study. The instructions are to: "Please report for the period of the past 30 days the total number of hours your personal problems (or presenting issue)"…[item here]. It uses a fill in the blank response for the number of specific hours of absence in the past 30-days for five ways that refer to how much the employee's ability to be at work were affected by their personal problem(s). Since its release in year 2010, the WOS has been cited in over 50 scientific papers (according to Google Scholar, November 2021). Based on past research using the WOS [57] the following five levels were used for the severity of absence: None 0 hours; Minimal < 4 hours; Low 4-8 hours; Moderate 1-3 days (9-24 hours); High > 3 days (25-159 hours). As other research shows the typical employee in the U.S. misses only about 3 hours per month of work due to health-related issues [58] problem status for work absenteeism was defined as 4 or more hours of absence (4-159 hours). Based on past research using the WOS [57,58] we excluded cases who reported 160+ hours missed and were not actively working. Unlike the other outcome scales, the work absenteeism measure did not use a set of statements to be rated, rather it asked for specific hours of missed work to be provided in five behavioral contexts and each context is added up for total number of hours of missed work. The mean scores for individual items on the absenteeism scale showed a skewed pattern, with three-fourth of the total hours coming from the first item on missing a full day(s) of work and the remaining one-fourth of the total coming from various kinds of partial day types of absence assessed by the other four items (i.e., being late arriving to work, leaving work early, change in work location and personal communication activity while at work). As expected, this measure had only modest internal reliability (α=.42 Pre; .56 Post) and test-retest stability (r_{paired}=.27).

Work Productivity

Originally a 32-item version, the brief 6-item version of the Stanford Presenteeism Scale (SPS-6) is a widely used scale for assessing the impact of health problems on work productivity of employees [59,60]. Since its release it has been cited in over 800 scientific papers (according to Google Scholar, November 2021). The SPS-6 consists of two dimensions, with one factor on completing work (items 2, 5 and 6) and a second factor on avoiding distraction while working (items 1, 3 and 4). It has response options of: (1) *Strongly disagree*; (2) *Somewhat disagree*; (3) *Uncertain*; (4) *Somewhat agree*; and (5) *Strongly agree*. The items are answered for the time period of the past month. Three of the six items are reverse scored (items 1, 3 and 4). The SPS-6 score is the sum of the three raw scores and the three reversed scores (range 6–30). A higher total scale score indicates greater work productivity despite experiencing a health issue. Based on the Consortium for Mental Healthcare [61], scale scores were grouped into five levels of work productivity, ranging from low to high: Very Low productivity 6-10; Low 11-15; Medium 16-20; High 21-25; Very High 26-30. This scale had excellent psychometrics with high internal consistency at both time points (α=.93 Pre; .96 Post) and a significant test-retest correlation (r_{paired}=.41). To allow us to conduct similar analyses of a change in "at-risk status" (like depression and alcohol outcomes) for this scale, we needed a way to split the distribution of SPS-6 scores into two groups of at-risk (i.e., a problem of poor productivity) or not at-risk. Other research indicates that the typical healthy employee is at about 85% productive on a scale of 0 to 100% when rating their own on-the-job productivity [58]. When the SPS-6 summary score was multiplied by 3.33 (to equate it with a 0-100 scale), the high productivity category started at 70 (out of 100 possible; SPS-6 original scores of 21-30). Thus, we defined a
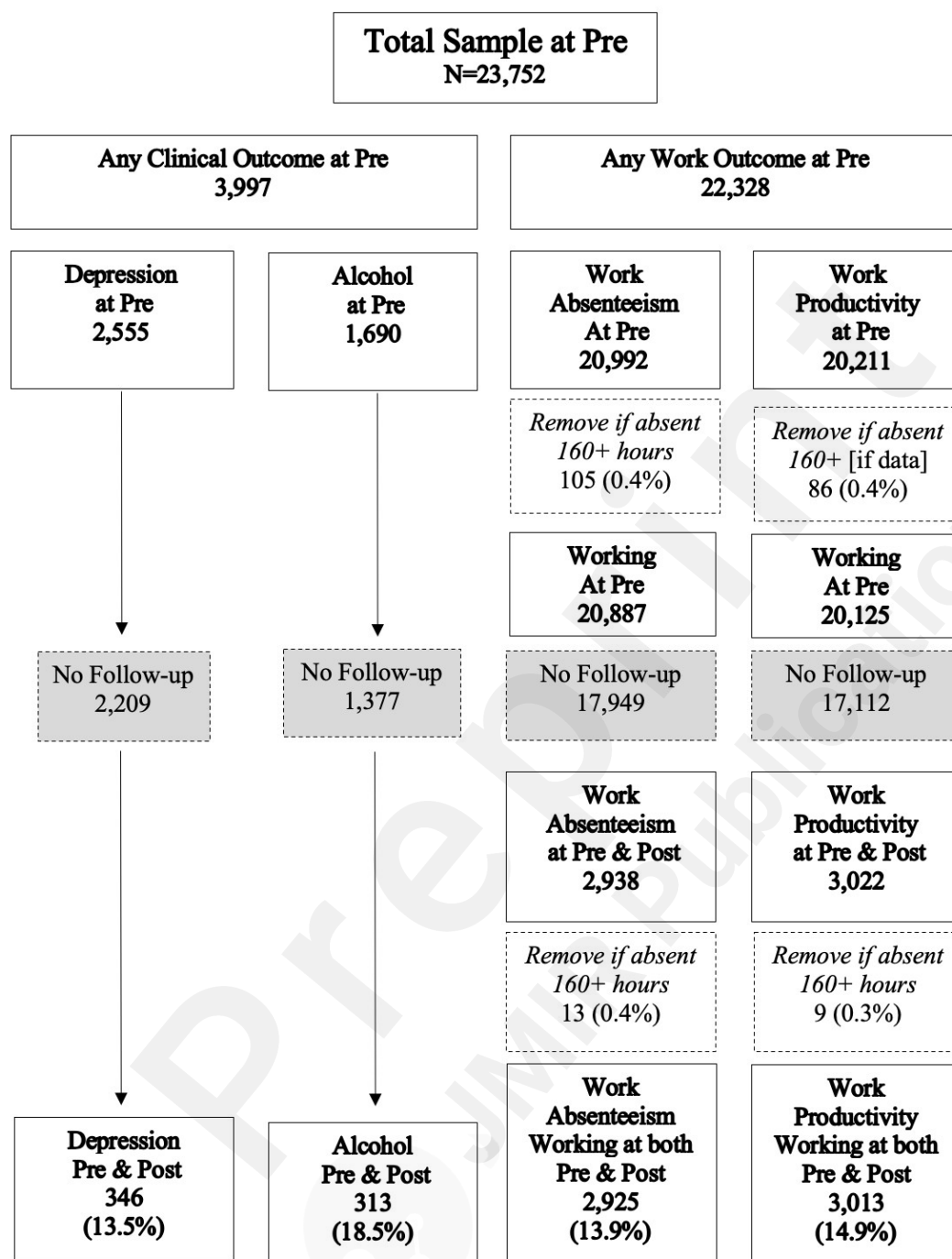
score on the SPS-6 at below a 70% level of productivity while working as having a work productivity "problem". This at-risk status corresponds with the medium or lower levels of work productivity (scores in range 6-20).

Note that the creators of this scale defined presenteeism as a positive aspect of work productivity [59]: "A decrease in presenteeism can hurt productivity in a way similar to an increase in absenteeism" (p .14). However, almost all other researchers in this area define the concept of presenteeism negatively as a problem of not being psychologically present enough while working to perform properly [62]. For example, Cooper and Dewe [63] defined presenteeism as "lost productivity that occurs when employees come to work ill and perform below par because of that illness" (p. 522). More simply put, Hemp [64] defined presenteeism as "at work – but out of it" (p. 49). Therefore, to align the interpretation of the SPS-6 scores better with the dominant deficit-themed definition of presenteeism, we retained the original 1-5 direction of the item ratings but labelled higher scores on the SPS-6 as indicating greater work productivity while at work.

Longitudinal Samples

The minimum criteria for inclusion in the longitudinal group for each outcome was having the outcome measure collected at both the start of the counseling and at the follow-up post use. The path from all cases with data at Pre to the final valid longitudinal sample for each outcome is shown in Figure 3. The descriptive background and demographic characteristics for each of the four outcome longitudinal samples are shown in Table 1. The clinical use characteristics for each of the four outcome longitudinal samples are shown in Table 2. There was some overlap of cases across the four outcome sample groups (mostly for the work outcomes), with a total of 4,017 unique cases who had longitudinal data on one or more of the four outcomes. The characteristics of the total longitudinal sample of unique cases are shown in Multimedia Appendix A.

Figure 3. Path from start of case to valid status in longitudinal sample: By outcome.

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                        ┌─────────────────────┐
                        │  Total Sample at Pre │
                        │      N=23,752        │
                        └─────────────────────┘
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Any Clinical Outcome at Pre 3,997		Any Work Outcome at Pre 22,328	
Depression at Pre 2,555	**Alcohol at Pre** 1,690	**Work Absenteeism At Pre** 20,992	**Work Productivity at Pre** 20,211
		Remove if absent 160+ hours 105 (0.4%)	*Remove if absent 160+ [if data]* 86 (0.4%)
		Working At Pre 20,887	**Working At Pre** 20,125
No Follow-up 2,209	No Follow-up 1,377	No Follow-up 17,949	No Follow-up 17,112
		Work Absenteeism at Pre & Post 2,938	**Work Productivity at Pre & Post** 3,022
		Remove if absent 160+ hours 13 (0.4%)	*Remove if absent 160+ hours* 9 (0.3%)
Depression Pre & Post 346 (13.5%)	**Alcohol Pre & Post** 313 (18.5%)	**Work Absenteeism Working at both Pre & Post** 2,925 (13.9%)	**Work Productivity Working at both Pre & Post** 3,013 (14.9%)

Depression Outcome Longitudinal Sample

The longitudinal sample with depression outcome data had 346 cases, which was 13.54% of the possible 2,555 cases at the start who completed the PHQ-9. Of this longitudinal group, 193 (55.8%) had depression as the primary clinical issue while the remaining 153 (44.2%) had depression as a secondary reason (see Table 2).

Alcohol Misuse Outcome Longitudinal Sample

The longitudinal sample with alcohol misuse outcome data had 313 cases, which was 18.52% of the

possible 1,690 cases at the start who completed the AUDIT-10. Of this longitudinal group, 113 (36.1%) had alcohol as the primary clinical issue while the other 200 (63.9%) had alcohol as a secondary reason (see Table 2).

Work Absenteeism Outcome Longitudinal Sample

Employees not working at all were judged as irrelevant to answer questions about limited absence from work. This condition was operationalized by excluding any employee who reported having 160 or more hours of absence in the past 30 days (this assumed a standard full-time schedule with an 8-hour daily work shift performed 5 days per week for the month). Thus, 105 cases were excluded who were not working at Pre and another 13 cases were excluded who were not working at Post. The longitudinal sample with work absenteeism outcome data had 2,925 cases, which was 13.93% of the 20,992 possible cases at the start who completed the WOS. These employees used the EAP to address a wide range of clinical and personal issues (see Table 2).

Work Productivity Outcome Longitudinal Sample

The longitudinal sample for the work productivity outcome was 3,013 cases, which was 14.91% of the 20,211 possible cases at the start who completed the SPS-6. Excluded from this final longitudinal sample for productivity outcome were 86 cases who were not working at Pre and another 9 cases who were not working at Post. Note that cases with work productivity data who did not have work absenteeism data for the same period (i.e., at Pre or at Post) were still retained as valid cases, as the likelihood of having 160+ hours of absence - and thus not working status - was very small (i.e., 1 in every 286 cases based on our data). These employees used the EAP to address a wide range of clinical and personal issues (see Table 2).

Table 1. Background characteristics of cases in longitudinal samples: By outcome.

Background measure	Depression (N=346) n (%)	Alcohol Misuse (N=313) n (%)	Work Absenteeism (N=2,925) n (%)	Work Productivity (N=3,013) n (%)
Year in study (date session 1)				
2017	28 (8.1)	15 (4.8)	352 (12.0)	310 (10.3)
2018	32 (9.2)	32 (10.2)	767 (26.2)	732 (24.3)
2019	89 (25.7)	64 (20.4)	695 (23.8)	768 (25.5)
2020	164 (47.4)	172 (55.0)	918 (31.4)	1002 (33.3)
2021 January-June	33 (9.5)	30 (9.6)	193 (6.6)	201 (6.7)
Industry of employer				
Manufacturing	81 (23.4)	110 (35.1)	699 (23.9)	713 (23.7)
Blue collar	13 (3.8)	28 (8.9)	182 (6.2)	182 (6.0)
Healthcare	72 (20.8)	58 (18.5)	529 (18.1)	547 (18.2)
Education	48 (13.9)	37 (11.8)	293 (10.0)	274 (9.1)
Government / public service	23 (6.6)	13 (4.2)	359 (12.3)	361 (12.0)
Financial / insurance	28 (8.1)	15 (4.8)	269 (9.2)	277 (9.2)
Retail / restaurant	49 (14.2)	34 (10.9)	264 (9.0)	296 (9.8)
Technology	10 (2.9)	6 (1.9)	196 (6.7)	234 (7.8)
Other	22 (6.4)	12 (3.8)	134 (4.6)	129 (4.3)
Referral source into EAP				
Self	332 (96.0)	216 (69.0)	2248 (76.9)	2394 (79.5)
Formal management	14 (4.0)	97 (31.0)	677 (23.1)	619 (20.5)
Client gender				
Male	153 (44.2)	208 (66.5)	1333 (45.7)	1283 (46.0)
Female	191 (55.2)	105 (33.5)	1587 (54.3)	1625 (54.0)
Client age	n=339	n=308	n=2728	n=2727
Under 30 years	101 (29.2)	58 (18.5)	509 (18.7)	499 (18.3)

30 – 39 years	110 (31.8)	104 (33.2)	855 (31.3)	870 (31.9)
40 – 49 years	77 (22.3)	63 (20.1)	659 (24.2)	674 (24.7)
50 or more years	51 (14.7)	83 (26.5)	705 (25.8)	684 (25.1)
M (SD)	37.09 (11.05)	40.64 (11.84)	40.89 (11.62)	40.80 (11.43)

Note: EAP=employee assistance program. *M*=mean. SD=standard deviation.

Table 2. Clinical characteristics of longitudinal samples: By outcome.

Clinical measure	Depression (N=346) n (%)	Alcohol Misuse (N=313) n (%)	Work Absenteeism (N=2,925) n (%)	Work Productivity (N=3,013) n (%)
Clinical modality of use				
Face to Face in-person office	222 (64.2)	188 (60.1)	2245 (76.8)	2184 (72.5)
Online video	124 (35.8)	121 (38.7)	440 (15.0)	496 (16.5)
Other digital modality	0	3 (1.0)	98 (3.4)	87 (2.9)
Dedicated to employer site	0	1 (0.3)	142 (4.9)	246 (8.2)
Clinical sessions limit				
3 or fewer sessions	42 (12.1)	28 (9.0)	338 (11.6)	332 (11.0)
4 sessions	0	1 (0.3)	14 (0.5)	13 (0.4)
5 sessions	168 (48.6)	156 (49.8)	1471 (50.3)	1498 (49.7)
6 sessions	86 (24.9)	91 (29.1)	788 (26.9)	815 (27.0)
7 to 10 sessions	40 (11.6)	31 (9.9)	270 (9.2)	274 (8.9)
Unlimited sessions	10 (2.9)	6 (1.9)	44 (1.5)	86 (2.9)
Average *M* (SD):	5.49 (1.76)	5.50 (1.50)	5.40 (1.45)	5.48 (1.57)
Clinical issue - primary				
MH – anxiety	23 (6.6)	30 (9.6)	421 (14.4)	419 (13.9)
MH – depression	**193 (55.8)**	41 (13.1)	325 (11.1)	351 (11.6)
MH – other	41 (11.8)	36 (11.5)	594 (20.3)	597 (19.8)
SUD – alcohol	2 (0.6)	**113 (36.1)**	137 (4.7)	130 (4.3)
SUD – other than alcohol	7 (2.0)	21 (6.7)	238 (8.1)	228 (7.6)
Stress – personal	35 (10.1)	32 (10.2)	247 (8.4)	245 (8.1)
Marital / relationship	20 (5.8)	16 (5.1)	444 (15.2)	506 (16.8)
Family / child	4 (1.2)	4 (1.3)	124 (4.2)	153 (5.1)
Stress – job-related	22 (6.4)	20 (6.4)	384 (13.1)	374 (12.4)
Other	0	0	11 (0.4)	10 (0.3)
Clinical duration (days)	(n=66)	(n=123)	(n=2,913)	(n=2,340)
Average *M* (SD):	37.09 (37.78)	53.14 (50.02)	50.90 (47.72)	50.09 (46.44)

Note: Dedicated=counselors were assigned to specific employers (onsite at workplace then more online since pandemic). MH=mental health disorder. SUD=substance use disorder. Clinical duration=days between first & last sessions; only if case completed the absence outcome measure. *M*=mean. SD=standard deviation.

Representativeness of Longitudinal Samples

As cases were not randomly selected to have outcome data collected, a preliminary task was to determine if the final sample of cases with valid Pre and Post data for each outcome were a reasonable representation of the larger population of cases at this EAP during the same five-year period with Pre data on the same outcome. Statistical tests were conducted, separately for each outcome, to compare the Pre only sample (i.e., those who completed a measure at baseline but not at the follow-up) with the longitudinal sample. Overall, the results indicated that the cases in the

longitudinal sample for each outcome had the same profile as employees in general at this EAP who had completed the same outcome measure only at the start of counseling when compared on variables of demographics, clinical use, context factors and the initial severity of the primary outcome (and initial scores on other outcomes too if also available). In total, 49 of the 52 tests conducted found either non-significant ($P<.05$) or trivial effect size differences based on statistical effect size. Details of these analysis are available upon request.

Overlap of Unique Cases for Multiple Outcomes and Inter-correlation of Outcomes

The four longitudinal samples for each outcome did have some overlap of the specific employees in each sample. The two clinical samples had very little overlap of cases, however, with only 25 cases in common from the 346 depression sample and the 210 alcohol sample. In contrast, the two work-related outcomes shared more than 8 out every 10 of their cases, with 2,350 in common among the 2,925 absence sample and the 3,013 productivity sample. The overlap of cases in the clinical outcome samples who were also in the two work outcome samples was as follows: 62 and 64 cases in the depression outcome group also had work outcomes data for absence and productivity, respectively; and 122 and 108 cases in the alcohol misuse group also had work outcomes data for absence and productivity, respectively.

The four outcome measures were correlated with each other when using scores at Pre among the cases in two or more of the longitudinal samples (see Table 3). More severe depression was associated with both missing more time from work and poorer work productivity. More severe alcohol misuse was unrelated to work absence but was associated with performing poorly at work. More work absence tended to co-occur with worse productivity when at work. This pattern of significant associations in expected directions for 4 of the 6 tests offers evidence for the convergent form of measurement validity for each outcome measure.

Table 3. Correlations between outcome measures at the start of counseling among subsets of cases with data on both measures in longitudinal samples.

Outcome measure	2	3	4
1 Depression - PHQ-9	.34 P=.09 (25)	.31 P=.01 (64)	-.26 P=.04 (62)
2 Alcohol misuse - AUDIT-10	-	.10 P=.29 (122)	-.31 P<.001 (108)
3 Work absenteeism - WOS		-	-.37 P<.001 (2350)
4 Work productivity - SPS-6			-

Note. Pearson correlation *r* coefficients shown with sample size n in parentheses. WOS absence hours measure was square root transformed.

Data Analysis Plan

All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) Version 27. All analysis were conducted with two-tailed tests of significance at P<.05. Analyses with categorical variables were conducted with chi-square (χ^2) non-parametric test procedures. The tests of improvement over time (Pre to Post) with the ratings on outcome measures were conducted using a repeated measures analysis of variance procedure (RM-ANOVA).

Tests of moderator factors for improvement in each outcome also used the same RM-ANOVA model. Potential moderator factors to include in such tests was based on results from preliminary analyses of the associations at baseline of each outcome score with client demographic factors, clinical use factors and study data collection context factors. Promising variables were then entered into a multivariate model as a set of variables to control for any shared influences on change in outcome.

For the sub-groups of cases at-risk for depression or at-risk for alcohol misuse, we also used a more sensitive analysis developed by Jacobson and Truax [65] that tested for the extent of clinical improvement achieved based on the Reliable Change (RC) index methodology. The development of certain statistics needed for the RC index analyses were derived from data specific to our study for depression and alcohol misuse (see Multimedia Appendix B). In addition, we calculated the number of at-risk cases who demonstrated "reliable recovery" [66] which is defined as when the case experienced *both* a clinically reliable improvement (based on the size of the difference between their Pre and Post scores) and recovery on the clinical symptom measure (i.e., changed from above the clinical cut-off score threshold at Pre to below the threshold at Post).

Statistical Power and Effect Size

With different sample sizes for each outcome, the power to detect a particular finding as being statistically significant in the longitudinal tests was assessed [67]. The level of power (out of 1.00

maximum) to detect a small size effect in repeated measures tests at $P<.05$ chance level was very high in this study at .99 for each of the four outcomes. To allow for reasonable comparison of the findings from outcomes involving different in sample sizes (i.e., the work outcomes had ten times the number of cases as clinical outcomes), we calculated the statistical effect size for most results. Partial eta squared (η_p^2) is a popular version of effect size statistics. This estimate can range from 0 to more than 1.00, but it is usually a number closer to the zero end of the scale. These effect sizes can be interpreted for magnitude as follows [68]: large size effect is $\eta_p^2=0.14$ or greater; medium size effect is $\eta_p^2=.006$ to 0.13; small size effect is $\eta_p^2=0.01$ to 0.05; and a trivial size effect is $\eta_p^2<0.01$ even if significant at P value less than 5% chance. Meaningful findings were defined as having both a statistically significant result and at least a small size statistical effect.

Ethical Considerations

The privacy of users was protected by having all program use and survey data deidentified before being shared with the independent consultant (first author) who conducted all statistical analyses. As this was an applied study of archival anonymized data collected from routine use of the service, additional informed consent from individual participants beyond their initial consent agreement in terms of use was not required. All data was collected as part of the normal business practices and not for a separate specific research project. Project approval from a university internal review board was not required. The use and analysis of archival operational data in this manner for applied research is consistent with the published ethical guidelines of the American Psychological Association [69]. All counselors involved in the delivery of the clinical treatment services were fully licensed and trained professionals. The real-world conditions for this study are like other applied studies published in peer-review journals that have examined the effectiveness of commercial mental health support programs [70-75].

Results

Part 1. Depression Outcome Improvement

Depression Severity in All Cases with Depression Issue

How these 346 cases in the full sample were distributed across the five levels of depression symptom severity at Pre and at Post shows a range of risk (see Figure 4). There was a shift from higher to lower severity after counseling for many cases, $\chi^2_{16,346}=141.3$, $P<.001$. The average employee with a depression issue had their severity of depression symptoms reduced by 58%. This was a large size statistical effect (see Table 4 and left side of Figure 5). On an individual level, at the start of counseling 210 (60.7%) employees were classified as clinically at-risk with moderate or more severe depression, but after counseling, only 43 cases were at-risk (12.4%).

Depression Severity in Clinical Cases with Depression Issue

Analyses were also conducted among the subsample of cases with clinical depression disorder at the start of EAP use. The symptom severity score for the average employee in the at-risk group was significantly lower at the follow-up and this change was a large size statistical effect (see Table 4 and top of Figure 5). For individual cases, 81.4% of the employees with depression disorder (171/210) had recovered at Post to no longer be at-risk. Thus, about 4 out of every 5 at-risk cases had recovered from depression disorder after use of EAP counseling. Moreover, according to the cut-offs established by Löwe and colleagues [58] partial remission (a score at Post in the 6-9 range) was achieved by 33.3% of all at-risk cases (70/210) and full remission (a score at Post of 5 or less) was achieved by 48.0% of all at-risk cases (101/210).

Figure 4. Risk levels for: A) symptoms of depression for employees who used the EAP for a depression issue; B) symptoms of alcohol misuse for employees who used the EAP for an alcohol issue. C) hours of missed work for employees who used the EAP for any issue; D) level of work productivity for employees who used the EAP for any issue.
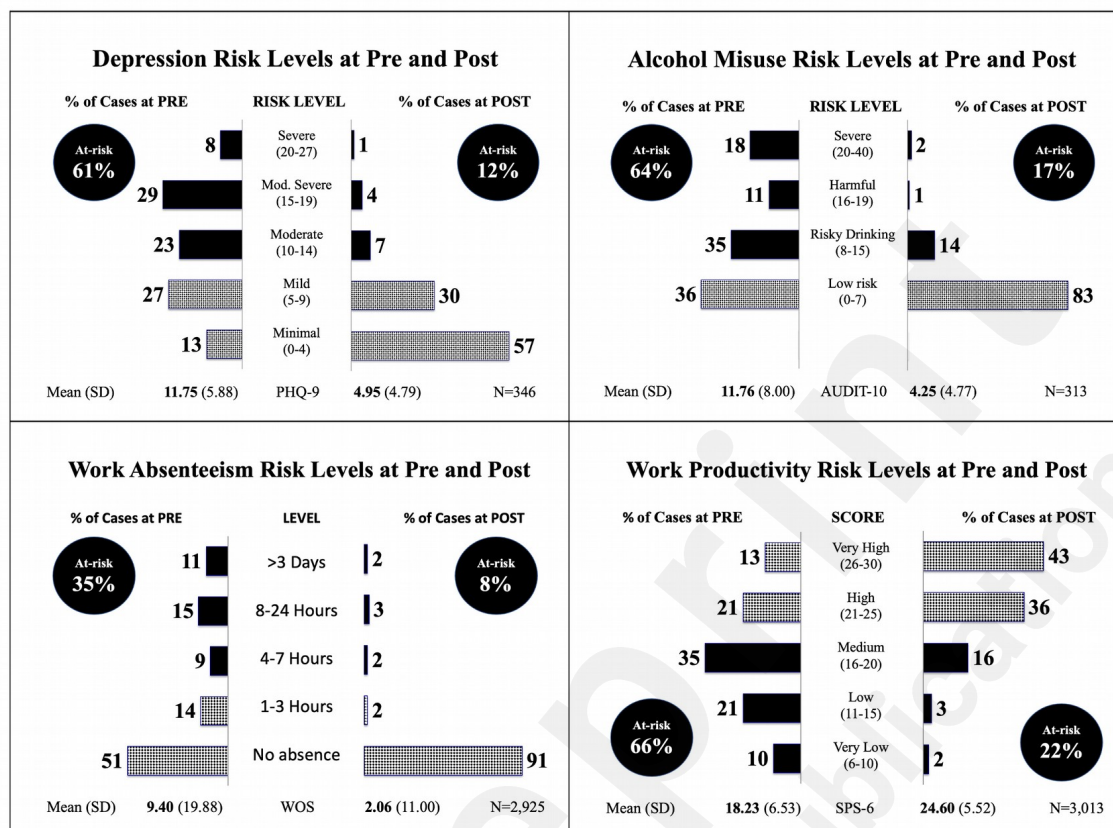
Figure 5. Results for longitudinal reduction in clinical symptoms of: A) Depression in all cases and at-risk cases using EAP for a depression issue; B) Alcohol misuse in all cases and at-risk cases using EAP for an alcohol issue.
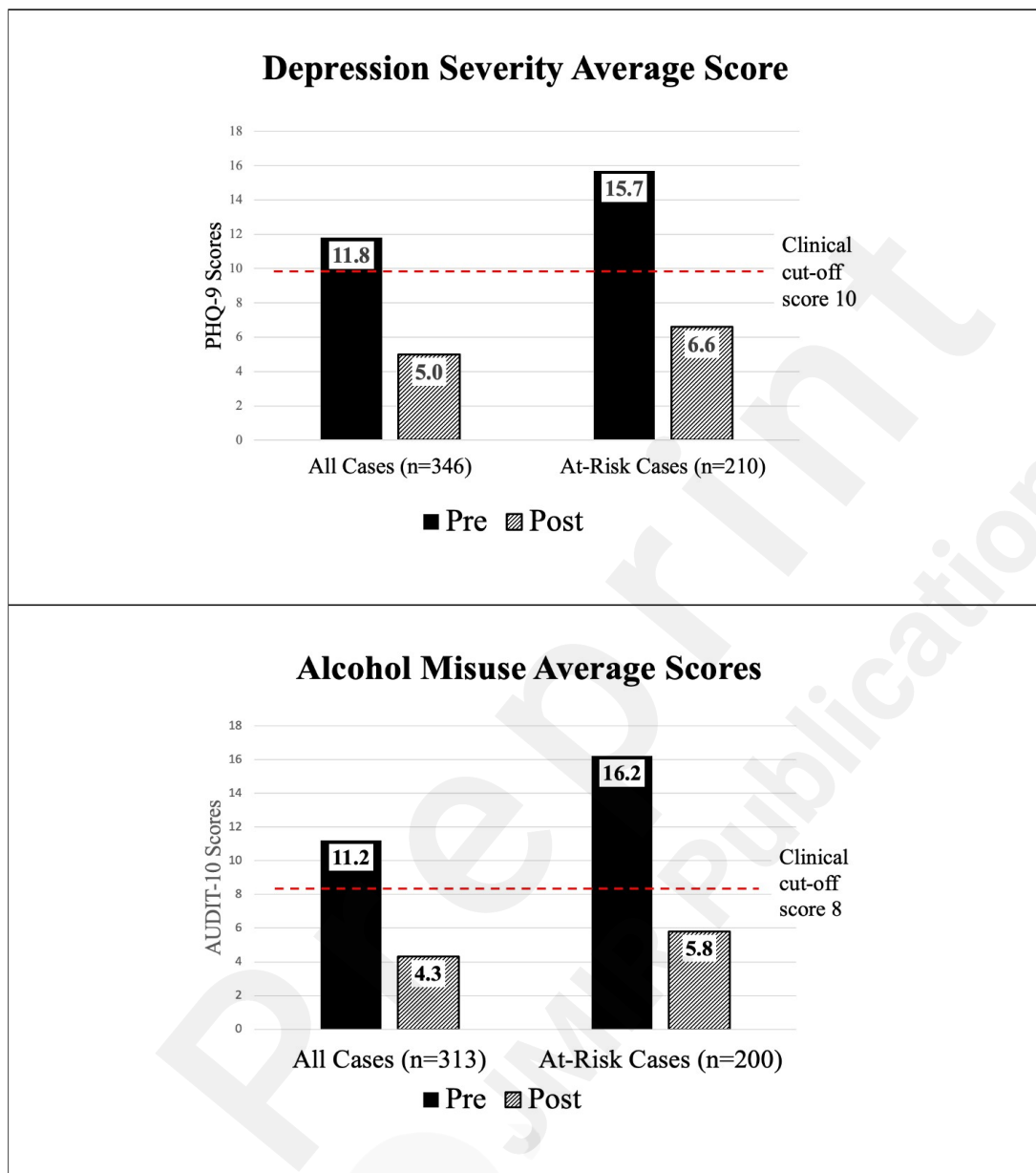
Table 4. Results for longitudinal change in outcomes for employee users of EAP counseling: By outcome and sample group.

Outcome	Time Period		Change
	Pre M (SD)	Post M (SD)	
Depression (PHQ-9 scale scores)			
Full sample (n=346)	11.75 (5.88)	4.95 (4.79)	-58%
	$F_{1,345}$=593.73, P<.001, η_p^2=0.63 large		
At-Risk subsample (n=210)	15.70 (3.63)	6.59 (4.35)	-58%
	$F_{1,209}$=977.96, P<.001, η_p^2=0.82 large		
Alcohol misuse (AUDIT-10 scale scores)			
Full sample (n=313)	11.76 (8.00)	4.25 (4.77)	-64%
	$F_{1,312}$=404.69, P<.001, η_p^2=0.67 large		
At-Risk subsample (n=200)	16.22 (5.56)	5.77 (5.31)	-64%
	$F_{1,209}$=519.95, P<.001, η_p^2=0.72 large		
Work absenteeism (WOS hours)			
Full sample (n=2,925)	9.40 (19.88)	2.06 (11.05)	NA
Square root transformed	1.80 (2.49)	0.37 (1.37)	-79%
	$F(1,2924)$=939.08, P<.001, η_p^2=0.24 large		
Work productivity (SPS-6 scale scores)			
Full sample (n=3,013)	18.23 (6.53)	24.60 (5.52)	35%
	$F_{1,3012}$=2819.20, P<.001, η_p^2=0.48 large		

Note. PHQ=Patient Health Questionnaire; higher scores indicate greater severity of depression experienced in the past two weeks (range 0-27). AUDIT=Alcohol Use Disorders Identification Test; higher scores indicate greater severity of alcohol misuse.

Part 2. Alcohol Outcome Improvement

Alcohol Misuse Severity in All Cases with Alcohol Issue

Figure 4 shows how the 313 cases were distributed across the four levels of alcohol misuse severity at Pre and at Post. There was a statistically significant change over time, with a shift from higher to lower severity after counseling for many cases, $\chi^2_{9,313}$=87.3, *P*<.001. Across all cases, the average symptom severity level of alcohol misuse was reduced by 64%. This change was a large size statistical effect (see Table 4 and Figure 5). On an individual level, at the start of counseling, 200 (63.9%) were initially classified as risky drinkers or at a more severe level of alcohol misuse. But at Post, only 54 (17.3%) cases were at-risk.

Alcohol Misuse Severity in Clinical Cases with Alcohol Issue

Analyses were also conducted among the subsample of cases who started counseling being at-risk for alcohol misuse. The average case with a clinical level of alcohol misuse had their symptom severity significantly reduced at the follow-up. This change was a large size statistical effect (see Table 3 and top of Figure 5). Among these 200 individual cases 146 (73%) were no longer at-risk for alcohol misuse after counseling.

Part 3. Work Absenteeism Outcome Improvement

Work Absenteeism in All EAP Cases

The 2,925 employees who used the EAP for any reason and reported their level of missed work per month both before and after counseling had an average of 9.4 hours of absence prior to therapy and just 2.1 hours at the follow-up. This change is a 79% relative reduction in absenteeism for the average employee. When using a square root transformed version of the measure of missed work hours, there was significantly less absence at follow-up for the average case and this change was a large size statistical effect (see Table 4).

Figure 4 shows the results for how employees were distributed across five levels of work absence at Pre and at Post. There was a statistically significant change over time, with a shift from more to less absence after counseling for many cases, $\chi^2_{16,2925}$=188.1, *P*<.001. Looking deeper into the results revealed that half of these employees (1487/2925, 50.8%) had zero absence during the month before starting counseling. This percentage with no absence rose to more than 9 out of every 10 cases (2656, 90.8%) at the follow-up. However, at the other extreme were some employees with a substantial amount of absence – defined as missing more than three full workdays in the past month. Only 11% (323) of all cases experienced this very high level of absence at the start of counseling. At the follow-up, only 2.2% (65) of employees reported missing 3 or more workdays in the past month. These findings show that missing a lot of work was not that common an experience for the typical employee user of the EAP.

Employees at a Problem Level of Work Absenteeism

When defined as missing four or more hours of absence in a month (i.e., more absence

than reported by a typical healthy employee), the percentage of all EAP cases with an absenteeism problem at Pre was 34.8% (1020/2925). This changed to be only 7.5% (219) of all cases at Post. Thus, almost four out of every five cases who were initially at a problem level of absence had recovered after use of EAP counseling to no longer miss more work than other employees in general (801/2020, 78.5%).

Part 4. Work Productivity Outcome Improvement

Work Productivity in All EAP Cases

Figure 4 shows the results for how the cases were distributed across the five levels of low to high work productivity at Pre and at Post. There was a statistically significant change over time, with a shift to higher levels of work productivity after counseling for many cases, $\chi^2_{16,3013}$=792.3, P<.001. For the 3,013 employees who used the EAP for any reason and had reported their level of work productivity at both before and after counseling, there was a significantly higher level of work productivity at the follow-up for the average EAP case. This change of a 35% improvement in level of work productivity for the average employee was a large size statistical effect (see Table 4).

Employees at a Problem Level of Work Productivity

The percentage of EAP cases with a work productivity problem at Pre was 66.2% (1995/3013) but this changed to be only 21.5% (649) of the total cases at Post. Thus, about two-thirds of the at-risk cases (67.4%, 1346/1995) had recovered to no longer have a work productivity problem after counseling.

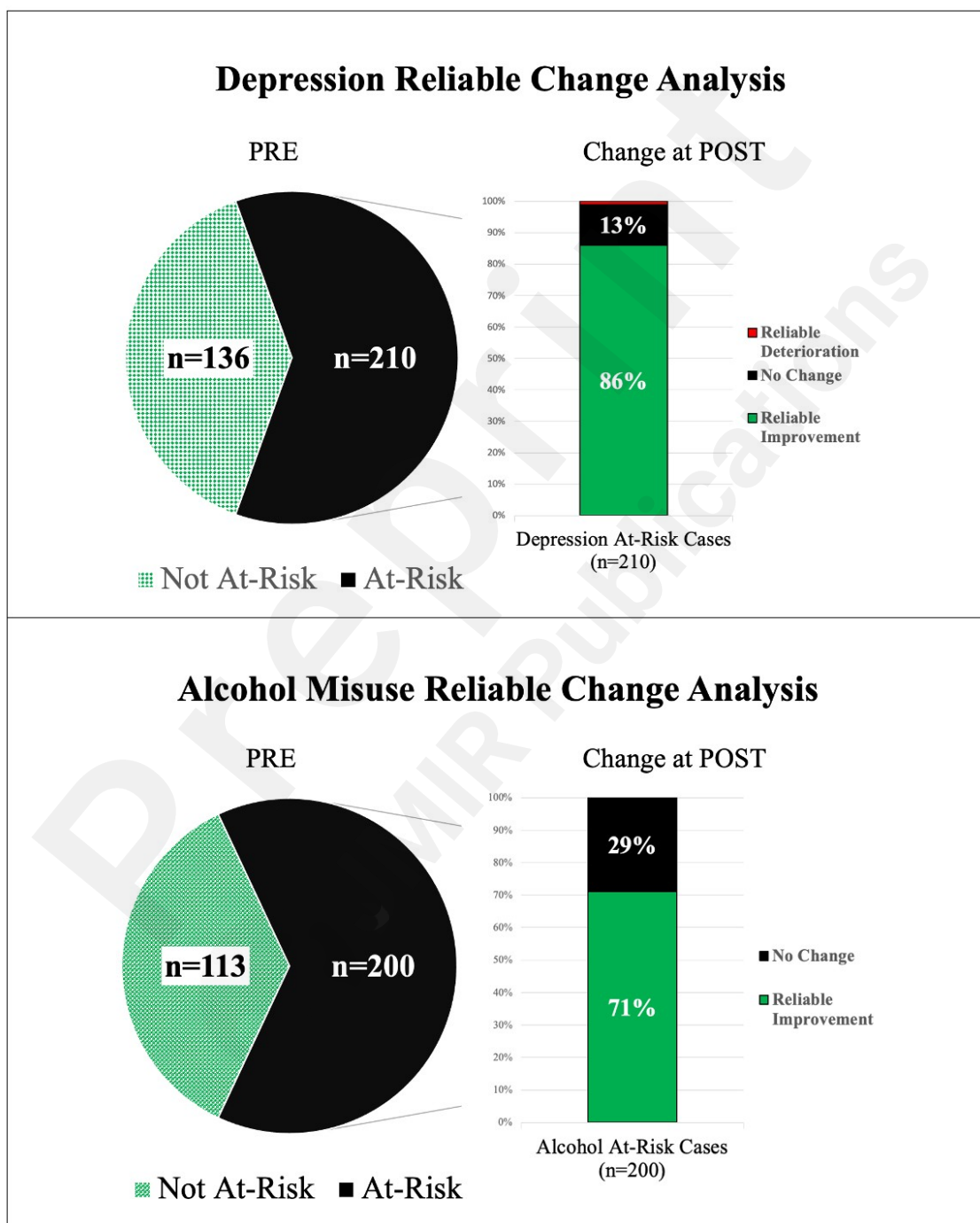## Part 5. Reliable Change Index Analyses for Clinical Outcomes

Reliable Change Index for Depression Severity

Results using the Reliable Change index methodology found that of the 210 cases starting therapy at a clinical level of severity for depression, 180 (85.7%) succeeded in having a statistically reliable level of improvement (i.e., a change in symptom scores from Pre to Post larger than chance level based on the measurement reliability of the PHQ-9 measure). Also, 28 (13.3%) of the 210 cases failed to have a reliable change and only 2 (1.0%) had reliable deterioration in their depression symptoms (i.e., got worse after counseling). In addition, 163 of the 210 at-risk cases (77.6%) achieved "reliable recovery" after counseling (i.e., their symptom score at Pre declined at beyond chance amount at the Post *and* their Post score was below the at-risk cutoff). These results are in shown in the top of Figure 6.

Reliable Change Index for Alcohol Misuse

Results using the Reliable Change index methodology found that of the 200 cases starting therapy at a clinical level of severity for alcohol misuse, 141 (70.5%) had reliable improvement, 59 (29.5%) did not have a reliable amount of change in their severity score and none had reliable deterioration in their alcohol misuse symptoms. In addition, 114 (57.5%) of these at-risk cases had the combined best outcome of both a larger than chance level reduction in symptom scores and had also improved at Post to no longer be at-risk. Thus, more than half of the at-risk alcohol cases had a "reliable recovery." These results are shown in the bottom of Figure 6.

Figure 6. Reliable Change Index results for severity level of: A) Depression for cases clinically at-risk who used the EAP for a depression issue; B) Alcohol misuse for clinically at-risk cases who used the EAP for an alcohol issue.

Part 6. Tests of Moderator Effects on Outcome Improvement

Table 5 provides a summary of the moderator test results for each of the four outcomes.

Moderators of Depression Outcome Improvement

The moderator results for depression outcome were conducted with client gender and clinical issue in the same model (see Multimedia Appendix Table C1). Results indicated only one factor moderated improvement. For clinical issue, cases who had depression as the primary reason for using counseling had more severe depression and had greater reduction in severity of depression symptoms after use than cases with a different primary issue (anxiety or other mental health issues, personal stress or all "other" topics) with depression as their secondary issue. This result was a small size statistical effect. Although gender of the client had some slight differences, they were not significant.

Moderators of Alcohol Outcome Improvement

The moderator results for alcohol outcome were conducted with the three factors of client gender, clinical issue and referral type (see Multimedia Appendix Table C2). Results indicated all three factors had significantly different outcome profiles, with each being a small size statistical effect. The gender of the client was a meaningful moderator of improvement in alcohol, as men had both greater severity levels and more improvement than women. Male clients were also much more represented among the alcohol outcome sample than female clients by a 2:1 ratio (n=208 *vs*. n=105, respectively). For clinical issue, cases who had substance use as their primary reason for counseling had the most severe alcohol misuse initially and also had the greatest reduction in severity of alcohol misuse symptoms after use compared to all other cases with a different primary issue (mental health, stressor all "other" topics) yet having alcohol misuse as their secondary issue. For referral source, cases who chose to use the EAP on their own (i.e., a self-referral) had greater alcohol misuse severity overall than cases who were referred to the EAP by their employer, but referral source did not moderate how much improvement occurred over time.

Moderators of Work Absenteeism Improvement

The moderator results for work absence outcome (see Table C3 in Multimedia Appendix C) indicated only one factor had meaningful differences in outcome profiles, and this was just a small size statistical effect. For referral source, cases who were referred by their employer into counseling had greater absence at the start and improved more after counseling (14 hours at Pre *vs*. <1 hour at Post) than cases who started counseling on their own (7 hours at Pre *vs*. 2 hours at Post). This finding suggests that missing work may have been a contributing factor to being formally referred to the EAP. Although factors of clinical issue and industry of the employer only had trivial differences in how much absenteeism was reduced after counseling, both had significant differences that may be of interest on how much various sub-groups differed from each other in their overall level of absence. For clinical issue, cases who had alcohol (13 hours missed per month before starting counseling) or depression (12 hours) as the primary reason for using counseling had the most absence while employees with a family issue had the least

absence (5 hours). For the industry types, cases who worked in healthcare (13 hours missed per month before starting counseling), manufacturing (12 hours) and retail/restaurants (11 hours) had the most absence, whereas cases who worked in the technology industry had the least absence (5 hours).

It is interesting that in the work absence outcome sample there were differences in the mix of clinical issues based on whether the employee was referred to the EAP by their employer or were a self-referral ($\chi^2_{4,2925}$=895.4, P<.001, large effect η_p^2=.31): alcohol or drug use was 41.2% (279/677) of formal referrals *vs*. 4.2% (95/2248) of self-referrals; job stress was 25.2% (171) of formal referrals *vs*. 10% (213) of self-referrals; mental health issues were only 28% (191) of formal referrals *vs*. 51.2% (1150) of self-referrals; and marital relationships / family issues were <1% (2) of formal referrals *vs*. 25.2% (566) of self-referrals). Thus, to some extent, the differences in absence levels between the formal and self-referral sources also reflect some clinical issue differences too, with formal referral cases far more likely to have alcohol or job-related problems and much less likely to have relationship, stress or mental health issues.

Moderators of Work Productivity Outcome Improvement

The moderator results for work productivity indicated three factors – referral source, clinical issue, and clinical duration – had meaningful differences in outcome profiles, however, each was a small size statistical effect (see Table C4 in Multimedia Appendix C). Compared to the self-referral cases, employees who were referred to the EAP for counseling by their employer had worse work productivity at the start and better work productivity at the Post, which resulted in significantly greater improvement after counseling. Clinical issue also had significant differences on how much various sub-groups differed from each other in their level of work productivity overall and in how much their productivity level improved after treatment. The top three issues with the most work productivity deficits at baseline before use included alcohol, job stress and depression. In contrast, family and marital issues had the least amount of work productivity problems. Finally, the factor of how long the employee was in clinical treatment with the EAP (i.e., number of days between dates of first and last session) did not affect the extent of improvement over time but it did have a small effect on overall level of work productivity such that longer treatment duration cases had higher work productivity than average or shorter treatment periods.

The same pattern was found among those employees with productivity outcome data ($\chi^2_{4,3013}$=897.3, P<.001, large effect η_p^2 =.32). The differences among employees in the productivity outcome sample included: Alcohol or drug use was 41% (254/619) of formal referrals *vs*. 4.3% (103/2394) of self-referrals; job stress was 25.5% (158) of formal referrals *vs*. 9% (216) of self-referrals; mental health issues were 27.6% (171) of formal referrals *vs*. 50% (1197) of self-referrals; and marital relationship or family issues were <1% (1) of formal referrals *vs*. 27.4% (658) of self-referrals). Like with the absence outcome data, this finding suggests that perhaps poor work productivity was a contributing factor to being formally referred to the EAP.

Table 5. Summary of moderator effects testing for differences between sub-groups on various client, clinical and context factors on overall level of outcome and improvement in outcome after use of EAP counseling: By outcome.

	Outcome			
Moderator factor:	Depression	Alcohol Misuse	Work Absenteeism	Work Performance
Clinical issue	*Small effect* Depression issue primary more severe depression and **more improvement**	*Small effect* Alcohol issue primary more severe misuse and **more improvement**	*Small effect* Differences in hours absent for some issue types but similar on improvement	*Small effect* Differences in productivity levels for some issue types and **more improvement**
Referral source into EAP	N/A to test	*Small effect* Self-referral more severe misuse and **more improvement**	*Small effect* Formal referral more absence hours and **more improvement**	*Small effect* Formal referral worse productivity level and **more improvement**
Client gender	No effect	*Small effect* Men more severe misuse and **more improvement**	No effect	No effect
Industry of employer	No effect	No effect	*Small effect* Differences in hours absent overall for some industries but similar on improvement	No effect
Clinical duration [a]	No effect	No effect	No effect	*Small effect* Certain differences in level of productivity but similar on improvement
Client age	No effect	No effect	No effect	No effect
Clinical modality	No effect	No effect	No effect	No effect
Clinical session limit	No effect	No effect	No effect	No effect
Year of use	No effect	No effect	No effect	No effect
Outcome data for depression	-	No effect	No effect	No effect
Outcome data for alcohol misuse	No effect	-	No effect	No effect
Outcome data for work absenteeism	No effect	No effect	-	No effect
Outcome data for work presenteeism	No effect	No effect	No effect	-

Part 7. Impact of the COVID-19 Pandemic

The consistency of clinical and work outcomes before and during the COVID-19 pandemic was also explored. The period involved a change in how the service was used. As the pandemic quickly rendered in-person face-to-face counseling as potentially unsafe for both the employee and counselor, there was a shift of service delivery modality to online video and other technology-based resources. Employees who still preferred to see an EAP counselor in a local office during the pandemic, however, were accommodated if proper health safety procedures were followed (i.e., wearing face masks). In the full sample of unique cases with any outcome data at baseline, before the pandemic started, face-to-face counseling accounted for over 94.2% (13600/14436) of all cases. But during the pandemic, face-to-face counseling was reduced to 34.4% (3202/9316) of the cases and the online video modality became the dominant way to provide EAP counseling at 58.5% (5453/9316). To test for possible differences in the level of outcome severity and differences in the extent of improvement after counseling, three groups of cases were created for each outcome:

    Group 1) face-to-face counseling in the pre-pandemic period;
    Group 2) face-to-face counseling during the pandemic; and
    Group 3) online video counseling during the pandemic.

Preliminary tests were conducted for descriptive purposes to examine the three groups within each outcome on available client background and clinical use factors. Even though the EAP business overall had a 27% increase in the average number of sessions of counseling actually used per case after the pandemic started compared to before, this data was not included at the raw data for the case. However, the three pandemic groups were similar in the average number for the maximum number of clinical sessions allowed per case in the business contracts associated with each employee user of the EAP in the study (all tests not significant). Other characteristics (age, gender, referral type, clinical issue, duration of counseling use) were also similar between the three groups (all tests not significant or very small statistical effect sizes). More importantly, none of the factors were meaningful moderators of the extent of change in the four outcomes from pre-pandemic to pandemic periods for these three groups of users (all interaction effect tests were not significant or had very small statistical effect sizes). These preliminary group profile descriptive test details are available upon request.

RM-ANOVA test results of the mean scores for each outcome by the three pandemic/modality groups are shown in Table C5 of Multimedia Appendix C. The test results revealed no meaningful differences between the starting and ending levels on the outcomes for each group nor in the rates of improvement from Pre to Post. Mean scores for each outcome by these three groups are shown in Figure 7. The slope from mean scores at Pre to mean scores at Post for each outcome by these three groups are shown in Figure 8. The near perfect overlap of the lines from Pre to Post for each group illustrates the similarity between the three groups in the extent of improvement in each outcome across the pandemic and clinical contact modalities.

Figure 7. Mean scores at Pre and Post for pandemic groups; A) depression; B) alcohol;
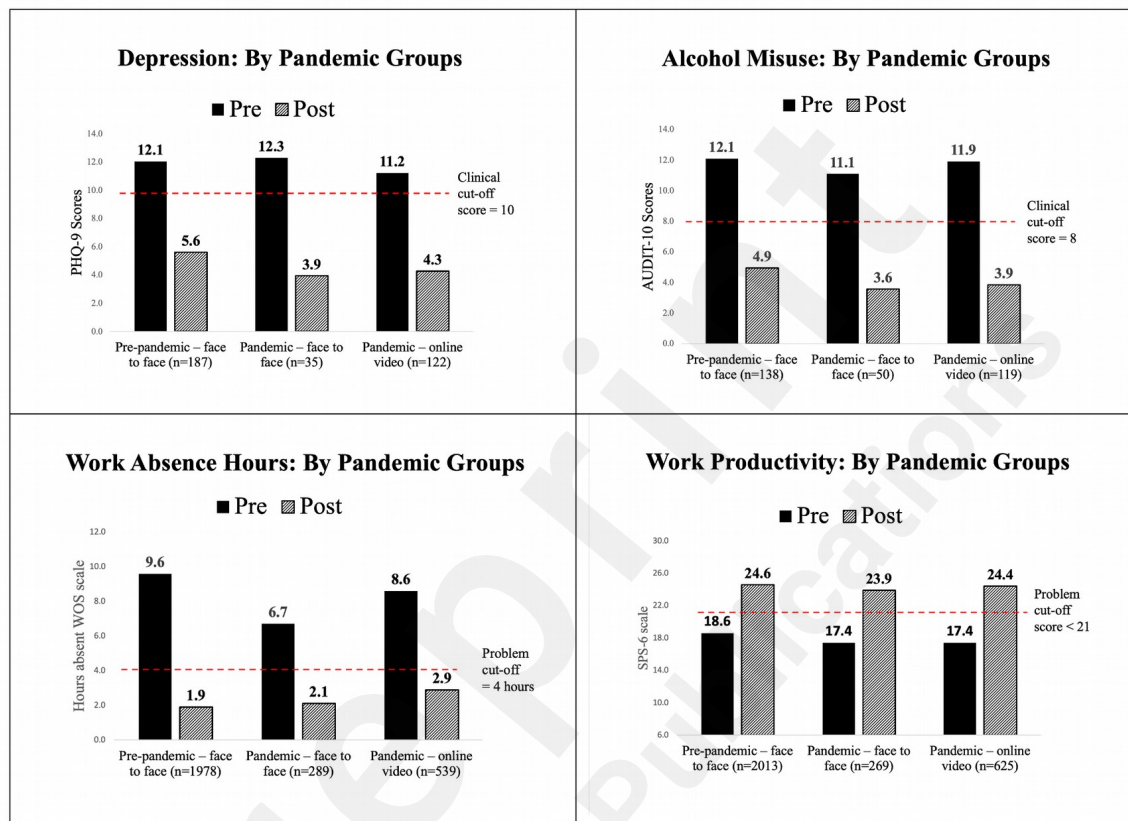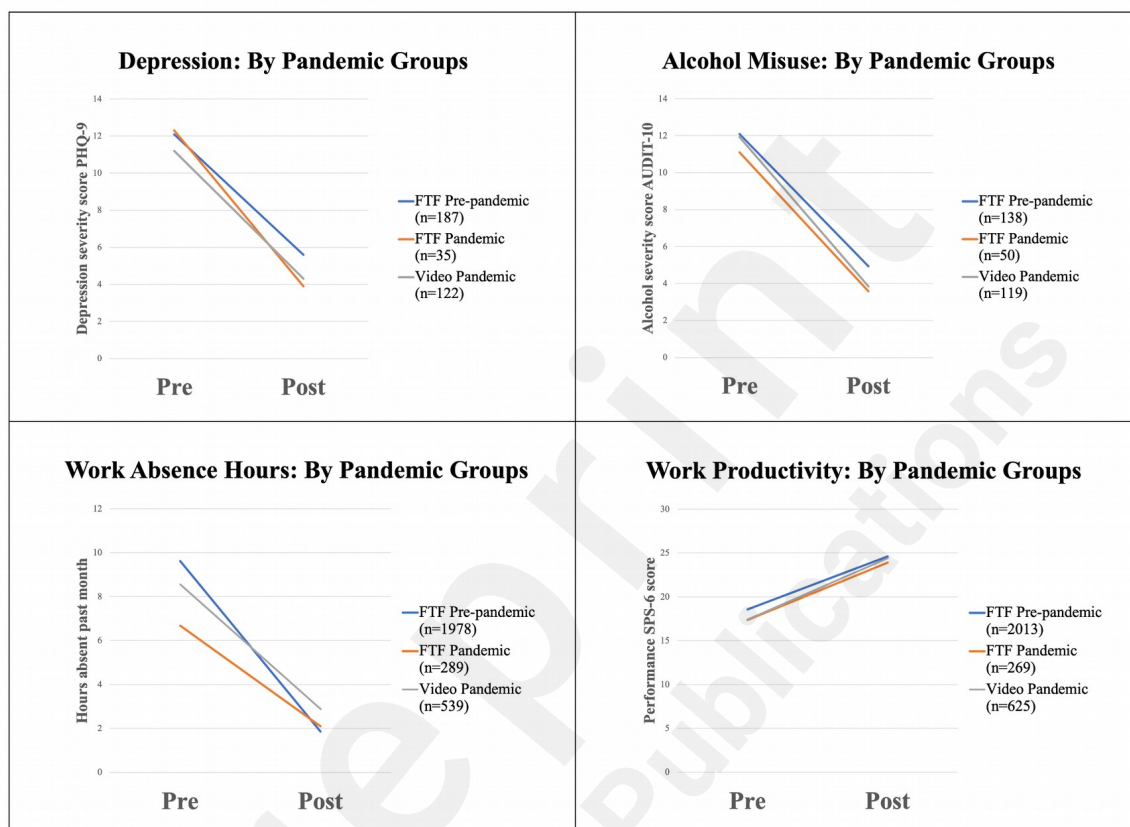C) Work absence mean hour; D) Work productivity.

Figure 8. Change from Pre and Post for pandemic groups; A) depression; B) alcohol; C) Work absence mean hour; D) Work productivity.

Discussion

Having a set of within-person data over a five-year calendar span with large samples of employees (over 23,000 at Pre and over 4,000 at Post) allowed us to examine the representativeness of the longitudinal test samples and the psychometric fitness of the four outcome measures. The applied naturalistic approach to the data collection process yielded groups of employee users for each outcome that had paired Pre and Post scores who fairly represented the much larger groups of cases who did not complete the follow-up survey part of the project. The outcome measures demonstrated high levels of measurement reliability and validity, with appropriate limitations for the absenteeism measure that differed in design from the other multi-item rating scales. Thus, the project provided favorable conditions to allow us to properly test for improvements in depression, alcohol misuse, work absence and work productivity after use of counseling.

Research Hypotheses and Questions Revisited

All four hypotheses predicting a significant improvement in clinical or work outcomes after the use of EAP counseling were supported by the empirical findings with large size

statistical effects. More focused tests conducted only among the clinical level cases initially at-risk on depression or alcohol misuse had even greater improvement. The Reliable Change index results also were important as they revealed most of the high-risk clinical cases had statistically significant reductions in clinical severity. Also important was that very few of the at-risk cases for either depression (1%) or alcohol issues (0%) had an adverse outcome of a reliable deterioration in clinical symptom severity after counseling. Thus, the counseling "did no harm" for almost all of the at-risk users of the EAP. The typical EAP case had almost one full workday of missed work per month restored after counseling. Work productivity increased by 35% after EAP treatment. In addition, over two-thirds of employees who started out at a problem level for either work absence or work productivity changed to no longer have such problems at the follow-up.

Both of the research questions for the study revealed mostly answers documenting the consistency of the effectiveness of the EAP counseling across the demographic, clinical use and external factors of the study context. In general, the story for moderator effects is a short one as most of the factors tested had either non-significant or trivial effect size findings. However, small size statistical effects were found with each outcome for select factors with most of these effects being for difference between certain groups in their overall levels of an outcome. Only 6 interaction effect tests had meaningful results indicating a difference between subgroups of a moderator factor in how much improvement was achieved after counseling and these were also all small size effects.

The most interesting moderator results involved the clinical issue, with the match between primary focus on depression / alcohol and greater initial severity before treatment and greater improvement after treatment. The other findings of differences between formal referrals and self-referrals are novel and merits further study to better understand the implications.

In this study we also explored results during the pre-pandemic and the active pandemic periods. For each time period, we found similar profiles of outcome levels at Pre and at Post and similar degree of improvements on each outcome at the follow-up. Thus, this EAP provided consistently positive results for most employees during a pandemic while switching the dominant delivery channel for care from in-person to remote technology-based options. The high level of client satisfaction was also similar in the two pandemic time periods.

One possible explanation for these positive findings is CuraLinc Healthcare's advocacy-based clinical model that drives the day to day operations. Unlike EAPs that offer participants an unverified list of mental health providers that they must contact on their own to confirm willingness to accept the referral, this model ensures participants are connected to providers with the required clinical specialty and confirmed appointment availability. It also reduces the likelihood of failed referrals (i.e., referrals that don't ever lead to an appointment with a provider), which may increase the likelihood of positive clinical and workplace outcomes, as well as client satisfaction.

Comparisons with Other Research

The demographic and clinical use characteristics of the employees in this national study sample aligns well with other major studies of employee users of external vendors of EAP counseling services [57,76,77]. A strength of this study was how the representativeness of the longitudinal samples was validated by testing the user demographic characteristics, program use experiences and starting level of the outcome measures compared to the much larger group of cases with only the Pre-test data. This step is often missing from most studies of EAP effectiveness.

The present study also replicates the findings of clinical effectiveness found in several past studies of EAP counseling on depression and alcohol outcomes [78-80]. More specifically, our findings for depression were compared to other recent EAP counseling effectiveness studies that have used the same Reliable Change index analytic approach with the same outcome measure for depression (PHQ-9). Lyra EAP found that 60% of the 845 cases at-risk with depression before counseling had reliable improvement after treatment (average of 9 clinical sessions over 13 weeks) and that 53% of the at-risk cases recovered at Post to below the clinical cutoff [75]. In another example, Lyra EAP examined a blended intervention program that combined live internet video-based sessions with a therapist plus digital lessons and exercises with other self-care tools encouraged for use between counseling sessions [73]. This study found that 66% of the 225 cases at-risk with depression before counseling had reliable improvement after 6 weeks of counseling and that 74% of the at-risk cases had recovered at Post to below the clinical cutoff. The results for at-risk depression cases in the present study from CuraLinc were higher on both metrics (86% reliable change and 81% recovered) and these outcomes were obtained with fewer clinical sessions (5.5 average) and less total time spent in treatment (average of 7 week period).

Our results for the work outcomes were also compared to most other studies in the literature on EAP effectiveness. The industry average is 9.7 hours absent in the past month at Pre and 4.1 hours at Post based on 6,145 counseling cases from different EAPs with longitudinal data on the same five-item WOS absenteeism scale used in our study [58]. The results in the present study were 10.0 hours of work absenteeism at Pre and only 4.2 hours at Post. This comparison indicates that the results of CuraLinc's EAP were similar to the EAP industry averages. The industry norms for the percentage of all EAP cases with a problem of poor work productivity was 56% at Pre and 28% at Post, based on over 35,000 cases from many different EAPs with the Workplace Outcome Suite Presenteeism Scale [58]. The same results in our study for the reduction in the percentage of all cases with a work productivity problem using the Stanford Presenteeism Scale was 66% at Pre and 21% at Post. This comparison indicates that the results of CuraLinc's EAP are also better than the industry average for work productivity.

The present study also replicates other literature documenting the similarity in psychotherapeutic effectiveness between live counseling when delivered in-person and when delivered over the internet [78]. This is important when the EAP industry has had to adjust to emphasizing the technology-based remote options for treatment during the

COVID-19 pandemic.

The level of individual user satisfaction with the counseling service (consistently at 95% out of 100%) is similar to the results at other external vendors of EAP services. For example, a major study [76] found an average of 94% of users satisfied with the counseling, based on annual book of business results aggregated across 50 different EAP vendors. What our results add to the literature is how satisfaction was maintained during the challenges of the COVID-19 pandemic.

Limitations of the Study

There are certain limitations to this study that involve the research methodology. It was conducted on convenience samples of adults who were working for many different employers in the United States who had access to the same commercially available EAP service. Our use of outcome measures completed by individual employees are examples of the "worker level outcomes" described by Tamers and colleagues [81] in their review of research methodologies for TWH. Our reliance on self-report sources for the data as other records or external sources of the outcomes could have potentially provided more accurate measurements. Some studies with both sources of data, however, do show self-reports for work absence and productivity are closely aligned with company record data [82,83].

Our use of data collected from a single group who used the counseling with repeated measures of outcomes is an example of a "pre-experimental" type of research design with no comparison group [81]. The other two stronger kinds of designs are quasi-experimental (with a comparison group involved) and the experimental randomized control trial (RCT). We also did not measure the possible use of other health-enhancing treatments during the same period as the EAP use. Therefore, the causal mechanism of how use of the EAP was specifically related to the changes reported on the clinical and work outcome measures needs further scrutiny to determine what are the most impactful aspects of the clinical experience and supportive resources. However, to be fair, in the entire 90-year history of the EAP field, we are aware of no study that has used a true randomized control trial (RCT) design and only a handful of studies have used a quasi-experimental longitudinal study design with a matched comparison group of non-users [79,80,84]. These studies all show that the EAP treatment group had superior improvement on health and work outcomes compared to matched groups of employees who did not use the EAP counseling.

Conclusion

This evaluation provides evidence that brief counseling is associated with measurable improvements for employees in both health and work domains. The in-person office visit and technology-based remote clinical delivery channels that switched in their frequency of use with clients after the pandemic started, had similar case-level characteristics, similar initial severity levels and rates of change in outcomes and similar user satisfaction ratings. The only real change was using slightly more sessions of treatment on a per case

average basis during the pandemic period. The lesson learned from this study is that effectiveness and evaluations during the pandemic were just as good as they were before the pandemic.

This study also shows that applied naturalistic research can be done in business settings that provide counseling. Other providers of EAP services are encouraged to also adopt the use of research-validated measurement scales for clinical and work outcomes and to conduct the testing necessary to ensure that longitudinal samples with outcomes are representative of the overall case mix at the EAP. Analyses in the future could also be done to estimate the potential cost-savings to employer sponsors of EAP services in areas of health care treatment costs for depression and alcohol and for reduced absenteeism and restored work productivity.

This study shows how providing effective brief counseling from a high-quality EAP program is one way companies can support employees with depression or alcohol issues and that the work impairments in missed work and lost productivity associated with a wide range of behavioral health, family, personal and work issues can be restored after use of brief counseling.

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Conflicts of Interest

The author is an independent research scholar and consultant who received financial support from CuraLinc Healthcare for preparing this research manuscript. The author has also occasionally worked on other projects for this company.

Abbreviations

AUDIT-10: Alcohol Use Disorders Test 10-item version
COVID-19: coronavirus disease
EAP: Employee assistance program
PHQ-9: Patient Health Questionnaire 9-item version
RC: Reliable Change
RM-ANOVA: Repeated measures analysis of variance
SPS-6: Stanford Presenteeism Scale 6-item version
WOS: Workplace Outcome Suite

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Supplementary Files

Figures

Timing of data collection by year and business quarter with COVID-19 pandemic highlighted in gray.

Year	Quarter:			
	Q1	Q2	Q3	Q4
2017	●	●	●	●
2018	●	●	●	●
2019	●	●	●	●
2020	●	●	●	●
2021	●	●	○	○
Total				

Note: COVID-19 pandemic started March of 2020 (in grey background).

○ = no data

● = yes data collected

Timing of longitudinal outcome data collection for the average case in EAP counseling.

The path from the start of the case at Pre to valid status in longitudinal sample: By outcome.

Risk levels at Pre and Post for counseling cases with longitudinal data: By outcome.

Depression Risk Levels at Pre and Post

% of Cases at PRE		RISK LEVEL		% of Cases at POST
At-risk 61%	8	Severe (20-27)	1	At-risk 12%
	29	Mod. Severe (15-19)	4	
	23	Moderate (10-14)	7	
	27	Mild (5-9)	30	
	13	Minimal (0-4)	57	

Mean (SD) 11.75 (5.88) PHQ-9 4.95 (4.79) N=346

Alcohol Misuse Risk Levels at Pre and Post

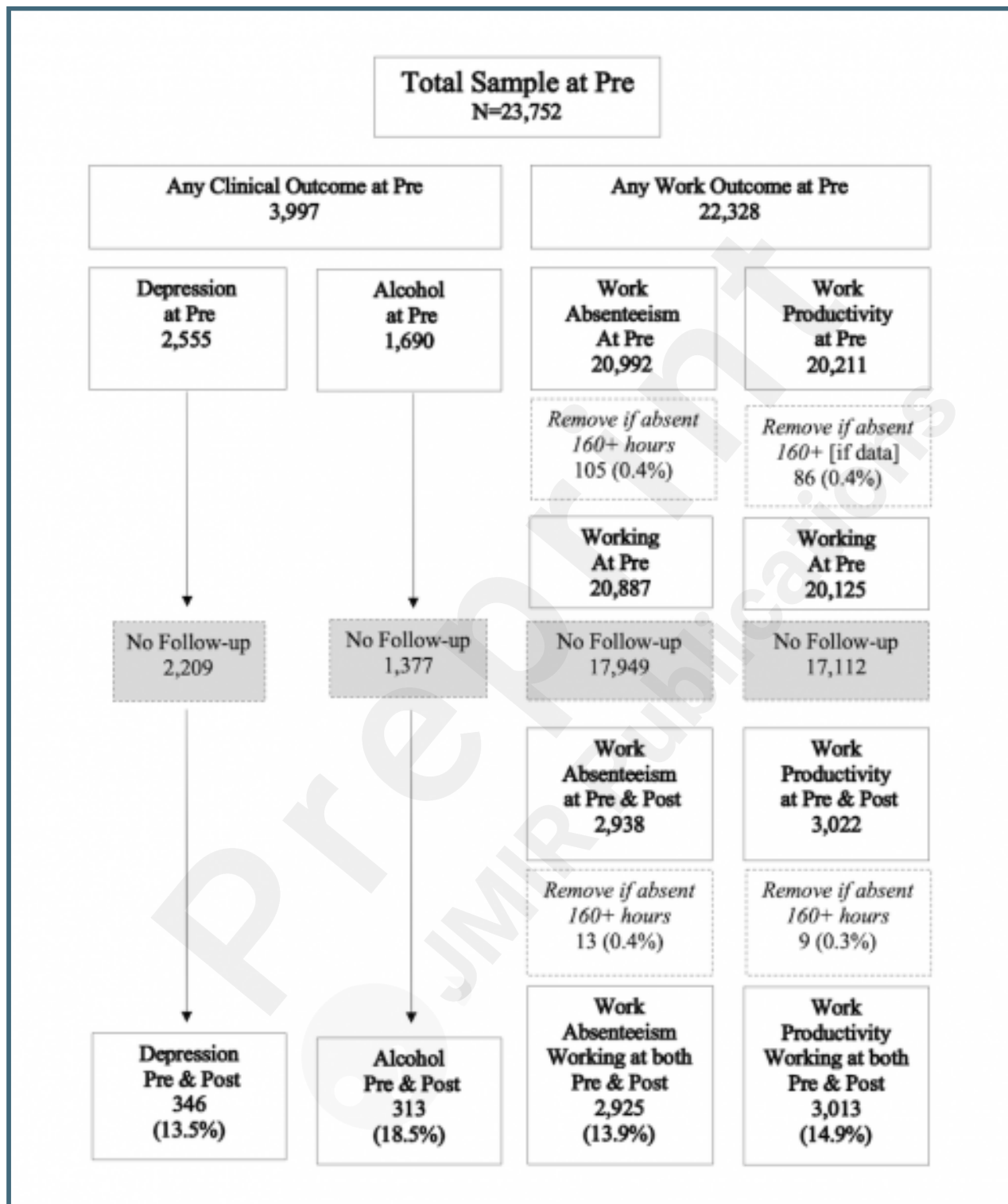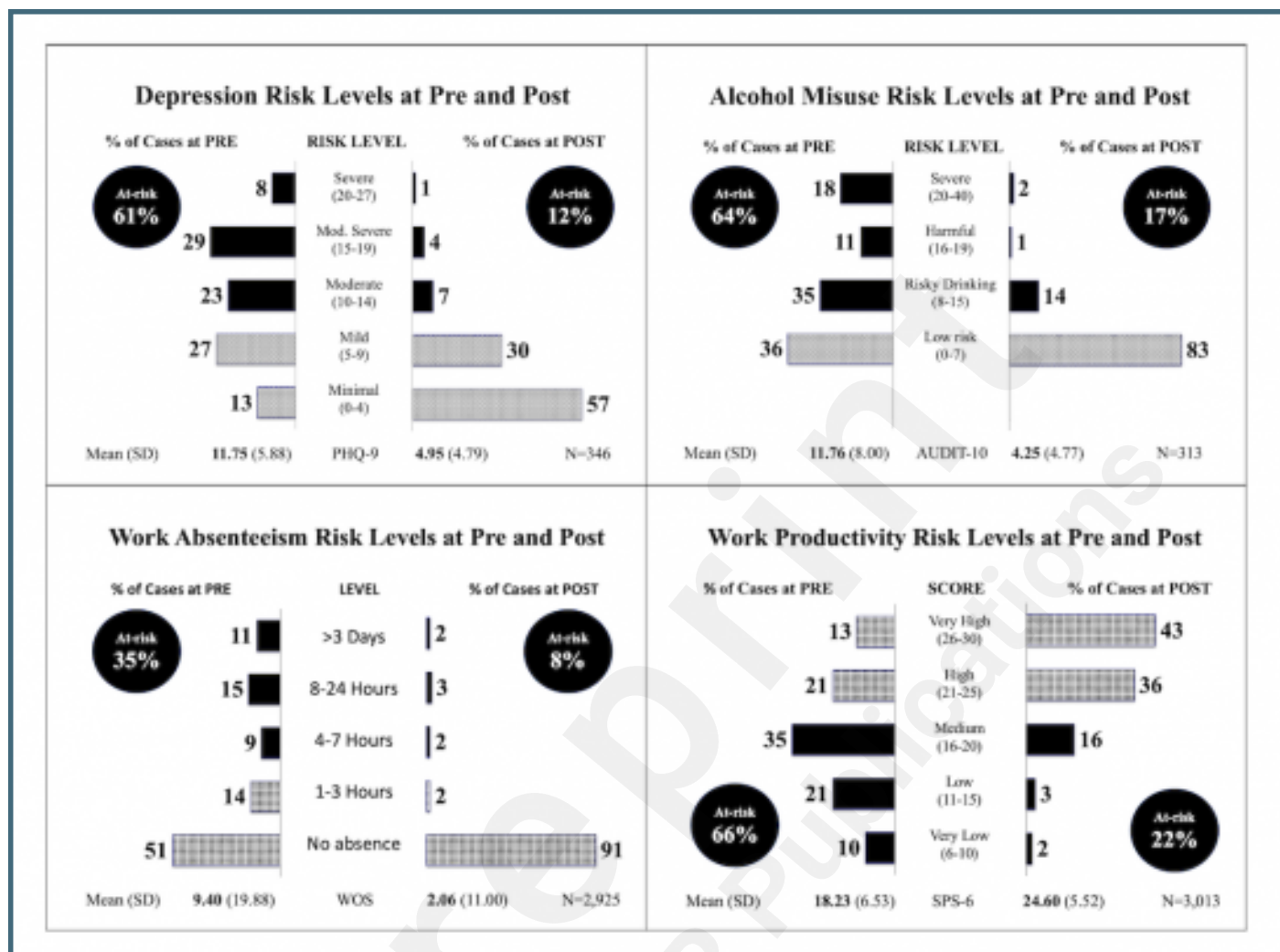| % of Cases at PRE		RISK LEVEL		% of Cases at POST
At-risk 64%	18	Severe (20-40)	2	At-risk 17%
	11	Harmful (16-19)	1	
	35	Risky Drinking (8-15)	14	
	36	Low risk (0-7)	83	

Mean (SD) 11.76 (8.00) AUDIT-10 4.25 (4.77) N=313

Work Absenteeism Risk Levels at Pre and Post

% of Cases at PRE		LEVEL		% of Cases at POST
At-risk 35%	11	>3 Days	2	At-risk 8%
	15	8-24 Hours	3	
	9	4-7 Hours	2	
	14	1-3 Hours	2	
	51	No absence	91	

Mean (SD) 9.40 (19.88) WOS 2.06 (11.00) N=2,925

Work Productivity Risk Levels at Pre and Post

% of Cases at PRE		SCORE		% of Cases at POST
	13	Very High (26-30)	43	
	21	High (21-25)	36	
	35	Medium (16-20)	16	
At-risk 66%	21	Low (11-15)	3	At-risk 22%
	10	Very Low (6-10)	2	

Mean (SD) 18.23 (6.53) SPS-6 24.60 (5.52) N=3,013

Results for the reduction in clinical symptoms for the average case for outcomes of depression and alcohol misuse.

Reliable Change Index analysis of change in severity level of clinical symptoms from Pre to Post: At-risk cases only by clinical outcome.

Mean scores at Pre and Post for pandemic groups: By outcome.

Depression: By Pandemic Groups

■ Pre ▢ Post

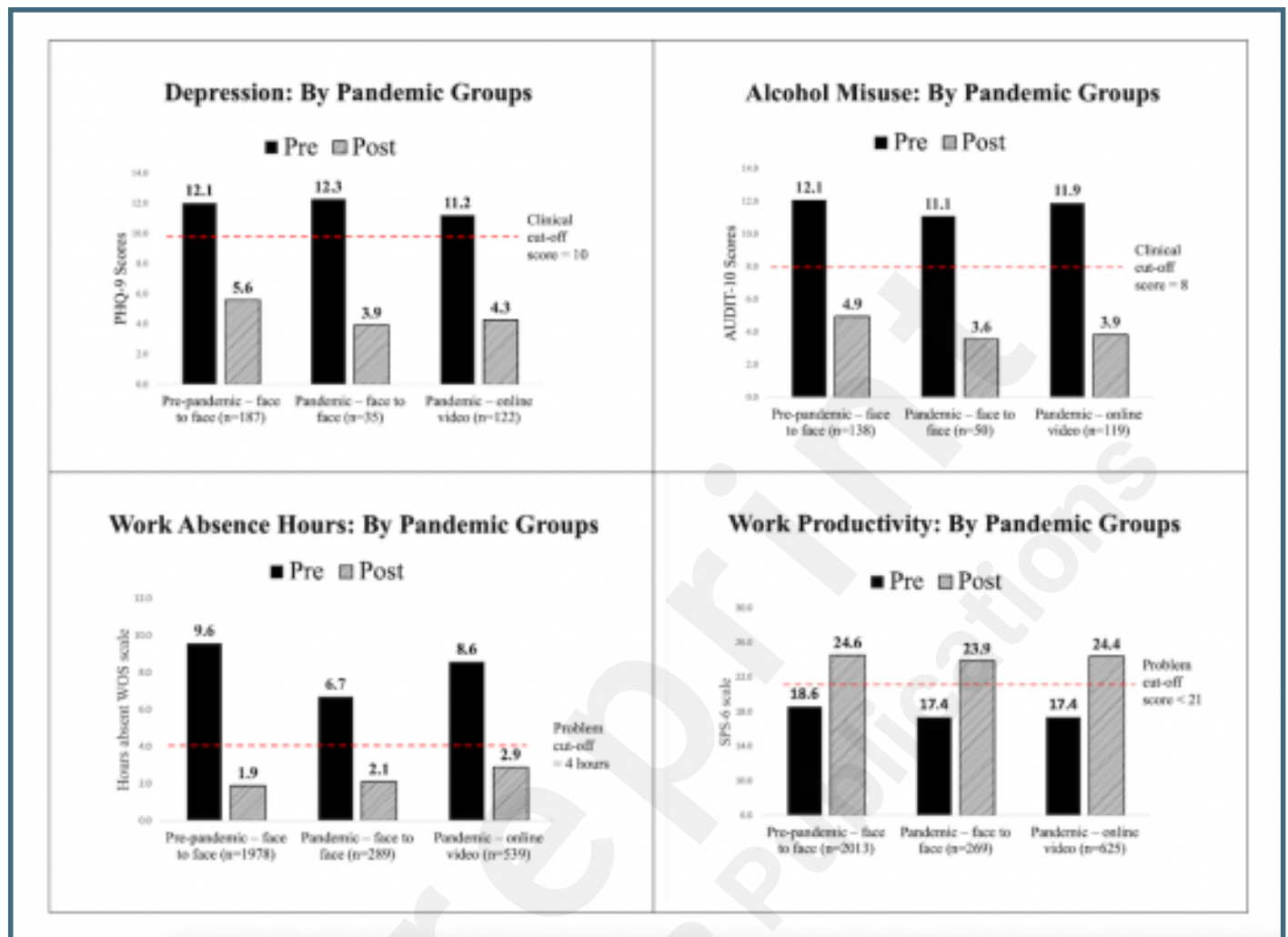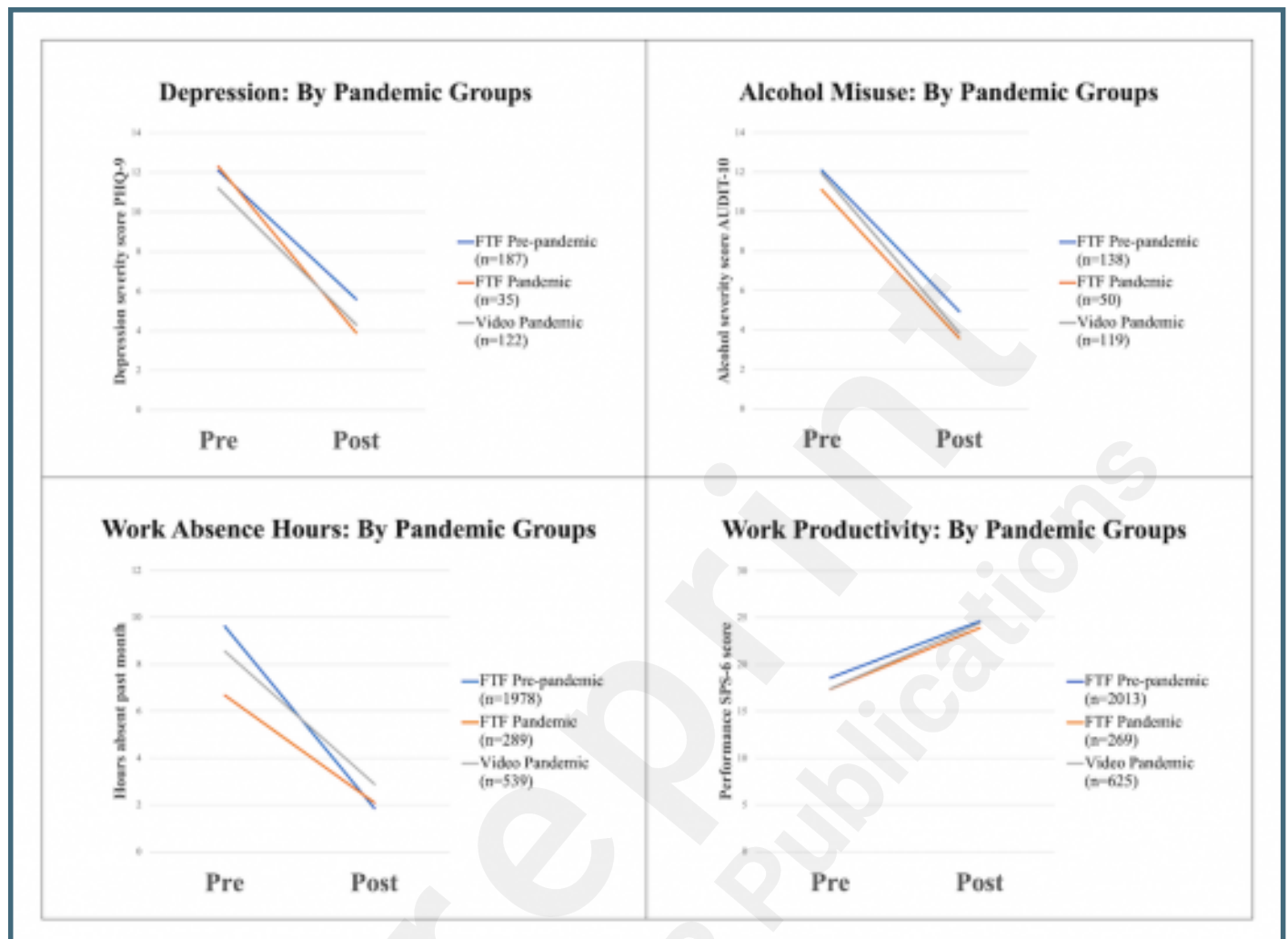- 12.1 / 5.6 — Pre-pandemic – face to face (n=187)
- 12.3 / 3.9 — Pandemic – face to face (n=35)
- 11.2 / 4.3 — Pandemic – online video (n=122)

PHQ-9 Scores. Clinical cut-off score = 10

Alcohol Misuse: By Pandemic Groups

■ Pre ▢ Post

- 12.1 / 4.9 — Pre-pandemic – face to face (n=138)
- 11.1 / 3.6 — Pandemic – face to face (n=50)
- 11.9 / 3.9 — Pandemic – online video (n=119)

AUDIT-10 Scores. Clinical cut-off score = 8

Work Absence Hours: By Pandemic Groups

■ Pre ▢ Post

- 9.6 / 1.9 — Pre-pandemic – face to face (n=1978)
- 6.7 / 2.1 — Pandemic – face to face (n=289)
- 8.6 / 2.9 — Pandemic – online video (n=539)

Hours absent WOS scale. Problem cut-off = 4 hours

Work Productivity: By Pandemic Groups

■ Pre ▢ Post

- 18.6 / 24.6 — Pre-pandemic – face to face (n=2013)
- 17.4 / 23.9 — Pandemic – face to face (n=269)
- 17.4 / 24.4 — Pandemic – online video (n=625)

SPS-6 scale. Problem cut-off score < 21

Change from Pre and Post for pandemic groups: By outcome.

Multimedia Appendixes

Characteristics of the longitudinal full sample of all unique cases across the four outcomes.
URL: http://asset.jmir.pub/assets/710f83f804c57b35c93b281fb40c979a.pdf

Reliable Change Index for Depression Outcome and for Alcohol Misuse Outcome.
URL: http://asset.jmir.pub/assets/0d0b050c001b80747486c1591966539f.pdf

Table C1. Moderator tests of depression outcome results for longitudinal change for users of EAP with depression issue; Table C2. Moderator tests for alcohol outcome results for longitudinal change for users of EAP with alcohol issue; Table C3. Moderator tests for work absenteeism outcome results for longitudinal change for users of EAP with any issue; Table C4. Moderator tests for work productivity outcome results for longitudinal change for users of EAP with any issue; Table C5. Results for longitudinal change in outcomes for users of EAP: By pandemic/clinical modality group.
URL: http://asset.jmir.pub/assets/14179e923d0798cd8849f398a498f0cc.pdf