Medical Research Archives

European Society of Medicine

OPEN ACCESS

Published: August 31, 2023

Citation: Mee S, Reist C, et al., 2023 Utility of Psychological Pain Measurement as a Population Health Risk Stratification Tool, Medical Research Archives, [online] 11(8). https://doi.org/10.18103/mra.v11i8.4281

DOI
https://doi.org/10.18103/mra.v11i8.4281

ISSN: 2375-1924

RESEARCH ARTICLE

Utility of Psychological Pain Measurement as a Population Health Risk Stratification Tool

Steven Mee*[1], Marissa Cascio BSRN [1], Christopher Reist[2,3,4]

[1]Aspera LLC, Los Alamitos CA, USA
[2]Department of Psychiatry & Human Behavior, UC Irvine School of Medicine, Irvine CA USA
[3]MindX Sciences, Inc.
[4]VA Long Beach Healthcare System, Long Beach, CA

***Corresponding author:** drmee@asperahealth.com or drmee@mybetterdays.com

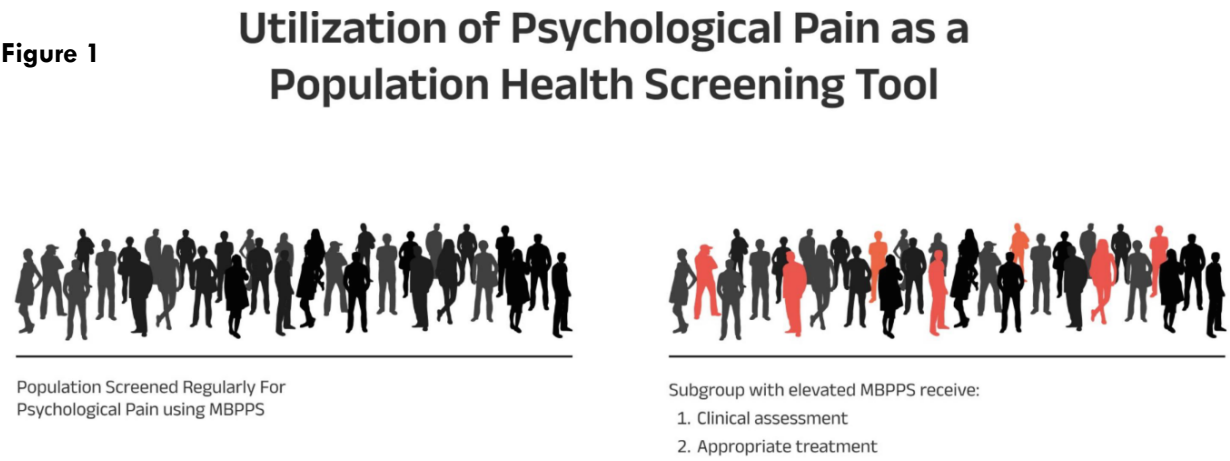
ABSTRACT

The goal of this review is to highlight the maturation of psychological pain as a novel mental health construct and propose an immediate clinical application for informing risk prediction and need-based stratification within complex heterogeneous psychiatric populations. This comes at a moment when prediction and prevention strategies specific to negative clinical outcomes in common mental disorders has not kept pace with other medical morbidities. Technological advances in next generation risk stratification methodologies utilizing genomics, neuroimaging, and biomarkers continue to yield encouraging progress to bridge this gap. As these technologies gradually reach performance and cost-basis milestones to allow broad adoption, readily available and validated psychometric assessment methodologies may assist in meeting the urgency of the moment while presenting highly favorable cost/benefit ratios. While previously studied primarily as an indicator of suicide risk, psychological pain is now recognized to be an important element across multiple psychiatric disorders. When systematically assessed at point of treatment entry, it can identify individuals with enhanced symptom acuity who are at increased risk for treatment failure, treatment dropout, suicide and various other negative clinical outcomes. Data exploring the predictive value of stratifying substance abuse patients by psychological pain yielded significant information specific to risk for dropout (treatment failure) and likelihood of future suicide events in depressive clinical populations months and even years prior to the clinical events. This information, available at treatment outset, can be utilized to improve the precision and effectiveness of resource allocation as well as provide the option to focus high intensity clinical interventions on an individualized basis which otherwise would be impractical if applied equally to the general population. Suggested strategies applying this approach to depressed and substance abusing treatment populations are described.

Introduction

Increasingly efforts are turning toward a focus on pre-morbid evaluative methods to inform risk prediction so that clinicians can more precisely design treatment plans with prevention as a primary goal[1,2,3]. Considerable practical and technological challenges to reaching these goals in behavioral health and translating them to meaningful clinical improvements remain. In particular, categorically based diagnostic approaches for risk prediction have not reached levels of accuracy and relevance with respect to treatment outcomes in mental health compared with general medical morbidities[4,5]. Subsequently, the standard of care generally emphasizes non-focused resource deployment that lags behind sentinel symptomology. These challenges, while not unique to psychiatry, present an opportunity to develop patient centered methods for improving precision in early identification of disease risk and acuity and to tailor treatment with the goal of both more effective resource allocation and clinical outcomes. The stakes are high, suicide, for example, claims more than 800,000 lives worldwide[6], and in the U.S., 1.7 million people attempted suicide in 2021 while 10 times as many contemplated doing so[7]. Substance Use Disorder, another highly prevalent condition with unacceptably poor treatment outcomes is estimated to affect at least 35 million people annually, only 15% of whom are treated[8] and in the U.S. alone burdens society with costs approaching $500 billion[9,10]. These are two common examples of the clinical and socioeconomic impacts from mental health clinical and societal morbidity which, while vastly better understood and treated than in the last century, remain stubbornly challenging to contain. In this review, we suggest that research efforts over the past two decades have provided valuable insight on elucidating the presence, frequency and dimensions of psychological pain as a ubiquitous, objectively measurable construct with multiple psychometric instruments currently available to assess it. This maturation as a construct is timely in allowing for a direct clinical application to assist in closing the gap in risk stratification of complex clinical populations.

Figure 1



Predictive risk assessment and stratification within behavioral health populations has been challenging due to the unique complexities of human psychopathology. These include a relative lack of comprehensive understanding of heterogeneous etiologies, disease progression and accurate prediction of treatment response compared with general medical morbidities[11,12]. Pharmacogenetic testing, expressome analyses and neuroimaging hold the potential to address these needs, however, clinical application on a large scale awaits further demonstration of clinical utility and cost effectiveness[13-16]. In the meantime psychometric-based approaches for clinical risk assessment offer a readily deployable, cost effective solution to meet this need and will complement emerging technologies.

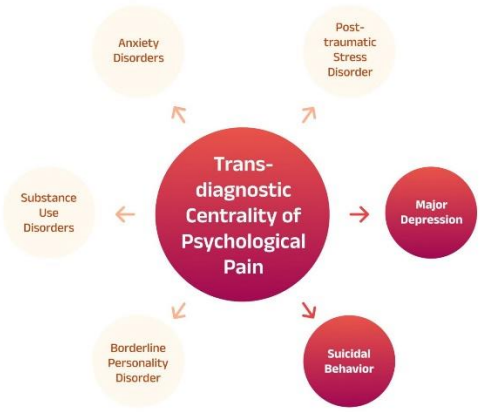
Development of Psychological Pain as a Unique Construct

Early attempts to develop mental health psychometric assessments, such as the mental status schedule by Robert Spitzer in 1961 spawned vigorous efforts to assess psychopathology systematically and objectively for mood disorders, psychoses, anxiety and other newly elaborated clinical conditions. These efforts built upon enthusiasm following the release of DSM-3 to transition psychiatry toward a more standardized, categorical-based diagnostic discipline. Many of these classic instruments, including the Beck Depression/Anxiety Inventories, Hamilton Depression Rating Scale and others[17-19] are widely cited in modern research settings. Widespread clinical adoption has been poor with clinicians most often citing time and resource constraints as

barriers[20]. Overcoming this adoption inertia in order to utilize psychometry routinely, despite the benefit of prioritizing treatment interventions is a considerable challenge.

In contrast to categorical multi-symptom and syndrome-based assessment tools, such as those developed to assess or diagnose mood and anxiety disorders, psychological pain (emotional pain, psychache, mental pain, etc) may be more psychometrically homogeneous depending on the method of assessment and considered a more proximal experience [21]. For example, a majority of studies have shown that psychological pain is a stronger predictive risk factor for suicidality than depression or hopelessness alone or combined[22-28].

Figure 2



Historically referenced in literature for centuries, efforts to determine the construct parameters of psychological pain were pioneered by Edwin Shneidman in the late 20th century[29,30]. Shneidman coined the term 'Psychache' and suggested it to be an essential antecedent for suicide; 'Without psychache, there is no suicide'[30]. In addition to pioneering efforts to describe psychological pain and describing its role in suicidality, Shneidman also led the earliest formal effort to develop an assessment tool specifically for psychological pain[31]. Developing methods to quantify psychological pain was invaluable for its development and maturation as a construct as well as providing a pathway toward clinical translation. Subsequently, a variety of instruments to assess psychological pain have been developed, differing in characteristics such as self-assessed Likert-type, thematic aptitude modeled that require interpretation, longform (Orbach and Mikulincer Mental Pain Scale (OOMP)), shorter (Mee-Bunney Psychological Pain Assessment Scale (MBPPAS), Psychache Scale (PS) and Three-Dimensional Psychological Pain Scale (TDPPS)) and very brief (Visual analogue based)[22-24,27-29]. In addition, there is variability in the time frame considered between instruments where the Mental Pain Questionnaire (MPQ) assesses past psychological pain and the MBPPAS assesses past, present and current tolerability while the other instruments variously assess one or more of those dimensions[29]. While no particular instrument has reached a level of universal acceptance in research or clinical medical settings, the PS, MBPPAS and OOMP have been cited in clinical populations most often and the MBPPAS was developed in and intended for use in general medical-psychiatric populations.

Measuring Psychological Pain in Clinical Populations

While the majority of studies have provided evidence cementing the influence of psychological pain on the development of suicidality, increasingly, data also suggests that psychological pain is relevant to other psychiatric disorders including Major Depressive Disorder, anxiety disorders, SUD, Obsessive Compulsive disorder and even personality disorders such as Borderline PD[29,30]. As a continuous variable, psychological pain has relationships with symptoms, diagnoses and suicidality increasing its potential utility[22,29,32].

More recently investigators have categorized psychological pain values, even simply dichotomizing populations into those scoring above or below a pre-identified scoring threshold for purposes of risk stratification for undesired negative clinical outcomes. Data using this approach is limited but results appear promising. To the best of our knowledge, the MBPPAS and PS have been utilized in this manner. In a clinical cohort diagnosed with current Major Depressive Episodes, depressed patients scoring above 32 (.5 SD above mean clinical scores) on the MBPPAS were found to be significantly associated with exceptionally high depression symptom acuity and these patients reported mean suicidality scores more than 2.5 times greater than depressed patients with sub-threshold mean psychological pains scores; a difference that was highly significant[22].

Predicting Outcome with Psychological Pain Measurement

In an attempt to replicate this finding in a different population and assess the potential for a pre-determined scoring threshold to separate patients into different risk strata for negative clinical outcomes, the authors applied the same scoring cutoff to a clinical population of acutely suicidal U.S. Veterans specifically selected for admission into a suicide prevention treatment program. Results lent support for using psychological pain to stratify even highly acute clinical populations for identifying individuals with extreme symptom acuity and risk for clinical failures, in this case suicide attempts. Specifically, patients scoring above the threshold (Approximately 18% of the clinical population) for high risk in psychological pain intensity on the MBPPAS at treatment entry were associated with mean suicidality and depression scores 75% and 80% higher than suicidal patients with sub-threshold psychological pain levels respectively[33]. On follow up, an interesting, albeit non-significant trend [p= .02 (p= .01 required)] noted that 7 out of 9 suicide attempts and the only actual completed suicide were all patients who had scored into the high psychological pain group at treatment initiation and, importantly, that these clinical failures occurred up to 15 months post screening.

Building upon these encouraging results, the same group applied this methodology in a diagnostic and demographically mixed population undergoing outpatient treatment for Substance Use Disorder to study the utility of using psychological pain as a risk stratification tool for predicting treatment failures. The authors screened all patients at treatment entry for psychological pain and other relevant symptoms then stratified the clinical population into high risk and lower risk by applying the same psychological pain threshold value of >32 as assed by the MBPPAS. 18% of the population were categorized as experiencing high psychological pain levels. Similar to prior reports in other populations, this subgroup scored 2.5 to 3.5 times higher on other symptom scales measuring depression and anxiety (Beck Depression and Anxiety Inventories) than their peers with subthreshold levels of psychological pain. Regarding the effect of psychological pain on treatment outcomes and risk prediction of treatment failure, the odds of dropout for high pain scoring patients at point of entry were 2.8 times higher than those in the low psychological pain category and notably these dropouts (treatment failures) occurred weeks to months post assessment. Importantly in terms of resource allocation, this high-risk patient subgroup dropped out of treatment up to 50% sooner[34] than lower risk categorized patients.

To date, the majority of research from clinical populations supporting the predictive value of utilizing a categorical approach to stratifying patients by psychological pain assessment at point of entry for risk of negative clinical outcomes remains limited to the MBPPAS and the PS. Risk prediction of outcomes other than suicide are limited to the MBPPAS. Troister[28] specifically derived and compared cutoff scores for depression, hopelessness and psychological pain (PS) finding that PS ≥27 were most predictive of suicidality while higher scores were not. Another study measuring PS, hopelessness and other correlates of suicide characterized scoring cutoffs of 'High' in each of the constructs and defined them as scores above median values. While no specific score threshold was suggested for risk stratification at a population level, the authors found a multiplicative additional risk for suicidal desire between psychological pain and hopelessness in a non-clinical diverse sample in Canada[35]. A study examining psychological pain scores from the OOMP, as a predictor of future suicide attempts found that each unit increase in OOMP scores resulted in 10.9% increased risk of suicide attempts, however, depression scores were associated with slightly higher predictive value in this sample[36].

Existing research efforts exploring the relationship between psychological pain and suicide has been well reviewed by others[22,37,38]. This current effort, rather, is intended to suggest that a categorical approach to systematic assessment of psychological pain can identify those patients experiencing the highest levels of psychological pain in heterogenous populations, thus representing a proximal early risk marker of negative clinical outcome potential in conditions beyond acute suicidality. Successful early

identification of these patients provides an immediate and highly cost-effective clinical application for psychological pain monitoring. Use of this information can improve the accuracy of risk evaluation and thereby help clinicians develop precise interventions for these high need patients. This gives the prospect of allocating clinical resources more appropriately and improving outcomes.

Figure 3a

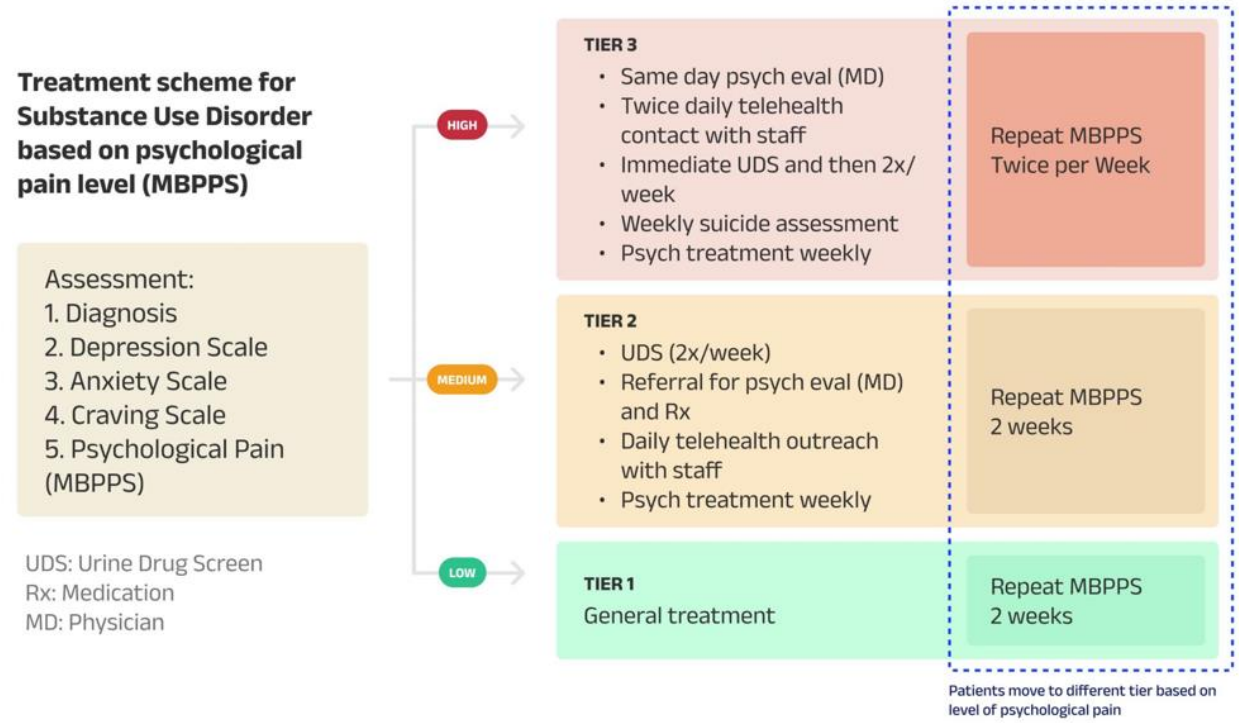
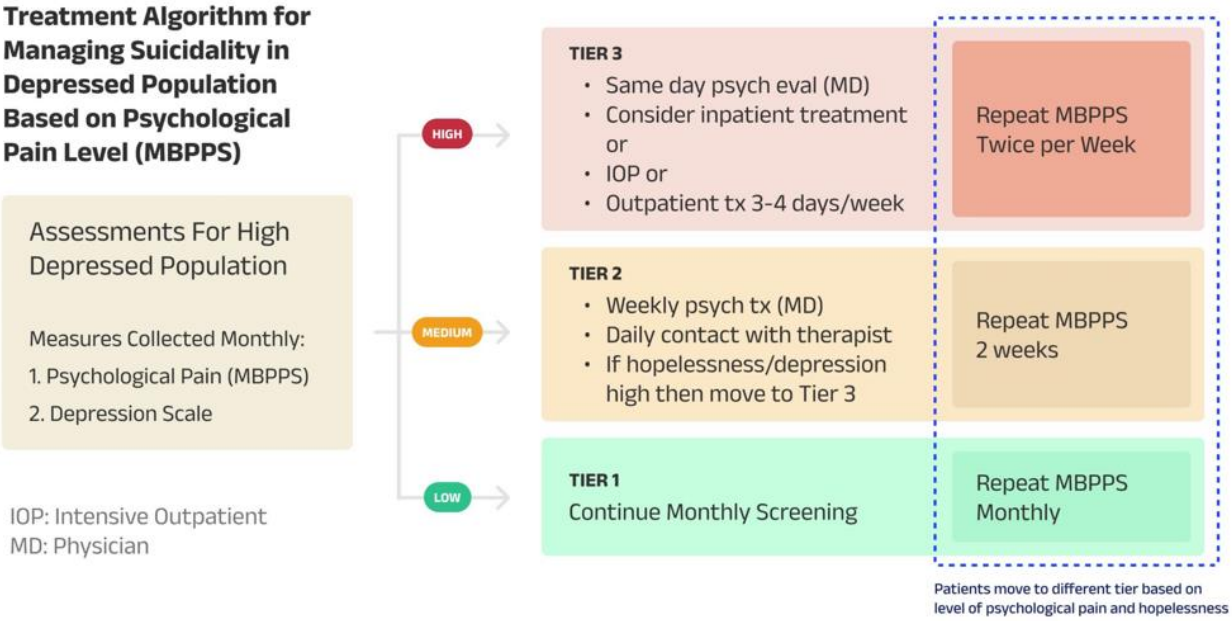


Figure 3b



Discussion

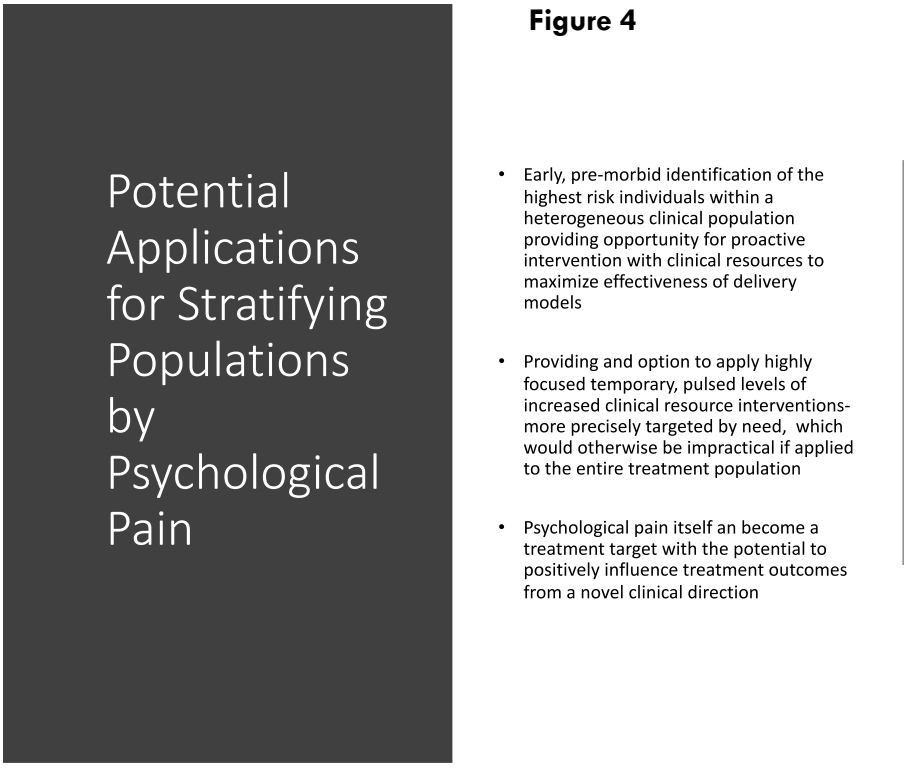
More than three decades of research progress, initially focused on identifying, elaborating and quantifying human psychological pain as a novel putative construct correlated with suicidality, and now more broadly accepted to be a transdiagnostic core component of many common clinically and societally important causes of psychiatric morbidity,

poise the construct for examination for candidate clinical applications. A convergence of recent evidence broadening our understanding of how psychological pain is related to depression, suicidality, substance abuse, OCD and other morbidities, supports consideration for employing categorical methods to synthesize psychological pain assessment across clinical populations as a means to evaluate risk and inform on intervention opportunities to improve outcomes. Recent studies exploring this method for clinical applications suggests an opportunity to merge progress in accurately assessing and examining psychological pain values from clinical populations with the ongoing need to provide clinicians more accurate tools and efficient methods for predictive risk assessment in mental health and close the gap between psychiatric and general medicine in this regard.

Mental health assessment and treatment intervention paradigms often continue to identify need and intervene after significant manifestation of symptoms and negative clinical outcomes occur. This approach lags behind contemporary progress in medicine where genetic testing, laboratory monitoring, imaging and other methods of surveillance and screening are broadly accepted and deployed to improve efficiency and effectiveness in managing and preventing morbidity, mortality and costs. Advancements in imaging and genetics, in particular, show encouraging potential to augment current preventive approaches to morbidity management and risk assessment, however, the unique challenges and complexities of psychiatric disease pose considerable headwinds to progress. While these nascent technologies continue to mature, psychometric testing offers a highly cost-effective opportunity to immediately contribute to this need, provided barriers of time, costs and clinician perceptions of assessment methods can be addressed.

Psychometric-based systematic assessment of psychological pain can augment risk assessment and stratification efforts in mixed clinical populations. Its utility in this regard, is enhanced, when the measured variable is viewed categorically, such as by employing simple scoring thresholds to stratify into higher and lower risk subpopulations. While more elaborate categorization of risk can be utilized with this variable, several studies support the predictive value of categorizing patients with this simple approach. [22,33-35,39,40]. When analyzed as a continuous variable, substantial research on psychological pain has improved our understanding of common, complex and costly psychiatric disease manifestations associated with high morbidity and mortality including Major Depression, Substance Use Disorder and suicidality among others.

Figure 4



Another application is to utilize psychological pain as a population health screening tool. This could identify subgroups to be flagged for additional evaluation and early intervention. Collecting this information can be done at scale in a very cost-effective manner.

A variation of this approach is to use psychological pain as a routine monitoring measure for psychiatric populations. For example, increased in psychological pain could be viewed as an "early warning" indicator of increased risk and acuity to be responded to accordingly (See figures 3 and 4). Substance Use Disorder is a particularly attractive candidate for applying this approach as it remains stubbornly associated with poor clinical outcomes possibly related to the "one size fits all" treatment approach. Taking into account psychological pain could provide a rationale for a more tailored and precise treatment approach.

Conclusion

There is now a significant literature establishing psychological pain as a core component common to a number of disorders. We suggest continuing the study psychological pain across clinical populations, especially in areas of mood disorders, suicidal behavior, personality disorders and substance abuse. Expanding on previously employed categorical approaches using thresholds is one strategy to demonstrate value in terms of achieving more personalized treatment, that is, matching interventions to needs. This approach is not new to medicine. Population screening incorporating laboratory, imaging and interventional tests, are commonplace in general medicine and have contributed to significant improvements in life expectancy, treatment prevention and efficacy as well as cost reductions. While we await broader adaptation of these technologies for psychiatric illnesses, adoption of currently available psychometric assessment of psychological pain as a marker of risk and symptom acuity is a readily available means, supported by encouraging preliminary data, to help bridge the predictive and preventative care gap between psychiatric and general medical morbidities.

Conflicts of Interest: The MBPPAS is copyrighted by Steven J Mee (2011).

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