

Abstract

The relationship between multiple myeloma (MM) and mental health has elicited few research attempts despite the existence of overwhelming evidence linking the two. It's common for cancer patients to experience adverse mental health events, and multiple myeloma is no exception. Whether pre-existing to or resultant from, multiple myeloma patients with coexisting mental health concerns should be eligible for clinical trials. This study analyzed previous clinical trials appearing within ClinicalTrials.gov to investigate the prevalence of mental health-related conditions in clinical MM studies. Of the 2908 multiple myeloma clinical trials analyzed, 12 mentioned terms relating MM to mental health in their inclusion criteria compared to 171 that mentioned terms related to mental health in their exclusion criteria. Mental health was further subcategorized into mental health conditions and substance abuse conditions in which greater disparities exist between inclusion and exclusion criteria. The evidence of the present study, combined with previous research, suggests a need for an increase in the number of clinical trials investigating the relationship between MM and mental health.

Background

Psychiatric and substance abuse disorders are considered two of the most profound causes of mortality and care in patients with multiple myeloma (MM) (Fillmore et al 2021, 1084). In addition, research has shown that many MM patients rely on alcohol or other substances to cope with mental health concerns post-diagnosis (Jeon et al 2022, 670). The availability of research investigating MM and mental health is trivial despite established relationships between the two as precursors and causative factors. Beyond the findings that indicate a relationship between MM and mental health concerns, additional research shows the reduced efficacy of common treatment methods in MM patients who also have substance abuse disorders (Chroma 2022, 7). To date, clinical trials tend to exclude MM patients with mental health and neurological disorders such as depression, epilepsy, or substance abuse disorders. Further research investigating MM patients with such conditions could improve the success of treatments across a wider population.

This study analyzed the prevalence of various mental health and neurological terms and conditions corresponding to MM clinical trials available through clinicaltrials.gov, the largest clinical trials repository in the United States. After further analysis, mental health was subdivided into two categories, mental health conditions and substance abuse concerns. The initial analysis of mental health terms elicited a notable presence of exclusion terms in both mental health categories. Given the link between mental health conditions and substance abuse disorders, combined with additional research suggesting an inverse dose-response relationship with MM, additional research should investigate the effectiveness of treatment with an emphasis on mental health and mind-altering substances in MM patients.

Methods

The eligibility criteria from the 2908 clinical trials that studied multiple myeloma (MESH ID D009101) between 1990-2020 were collected using Python3.9.10 and the publically available

repository www.ClinicalTrials.gov. In conjunction, the inclusion and exclusion sections of each resulting study were searched for specific terms related to mental health (Table 1) and substance abuse (Table 2). The extrapolation of data yielded a total of 191 MM clinical trials that mentioned at least one term related to mental health and/or substance abuse in their eligibility criteria (Table 3). Clinical trials that lacked separate inclusion and exclusion sections (24 studies), as well as those that mentioned the same search term in both their inclusion and exclusion sections (one study), were flagged and manually inspected to determine how each search term was associated with enrollment eligibility.

Once data was collected, all terms were compared to review the respective inclusion and exclusion prominence and to identify any significant trends. Data was further subdivided to isolate and evaluate natural mental health conditions versus substance-related concerns. Cumulative and isolated data were collected and reviewed by inclusion and exclusion frequencies.

Search terms related to mental health or substance abuse comorbidities in MM clinical trials	# clinical trials with term in inclusion criteria	Inclusion rate of term	# clinical trials with term in exclusion criteria	Exclusion rate of term
Anxiety	2	28.57%	5	71.43%
Bipolar disorder	0	0.00%	6	100.00%
Depression	4	14.81%	23	85.19%
Depression .bipolar	0	0.00%	2	100.00%
Depressive disorder	0	0.00%	3	100.00%
Mental disorders	4	44.44%	5	55.56%
Mood disorders	0	0.00%	1	100.00%
Psychosis	0	0.00%	30	100.00%
Psychotic disorders	0	0.00%	4	100.00%
Schizophrenia	0	0.00%	6	100.00%
Suicidal ideation	0	0.00%	5	100.00%
Suicide	0	0.00%	1	100.00%
TOTAL:	10	9.90%	91	90.10%

Table 1. Inclusion and exclusion frequencies of mental health-related terms in MM clinical trials.

Search terms related to substance abuse comorbidities in MM clinical trials	# clinical trials with term in inclusion criteria	Inclusion rate of term	# clinical trials with term in exclusion criteria	Exclusion rate of term
Alcohol abuse	0	0.00%	26	100.00%
Alcohol dependency	0	0.00%	2	100.00%
Alcoholism	0	0.00%	42	100.00%
Opioid dependence	0	0.00%	1	100.00%
Smoking	2	28.57%	5	71.43%
Substance abuse	2	4.00%	48	96.00%
TOTAL:	4	3.13%	124	96.88%

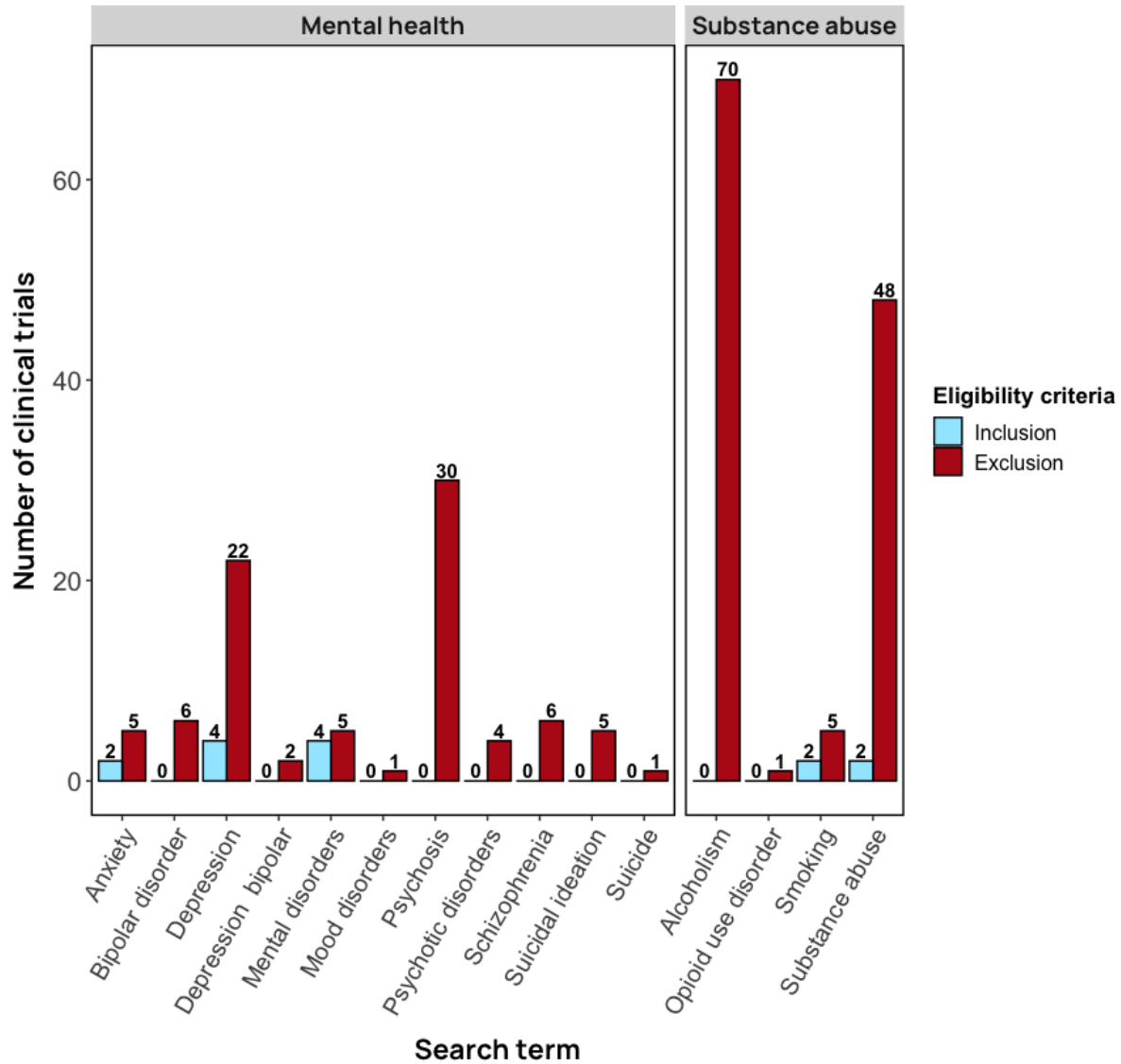
Table 2. Inclusion and exclusion frequencies of substance abuse-related terms in MM clinical trials.

Search terms related to comorbidities	# MM clinical trials with ≥1 related term(s) in inclusion criteria	% MM clinical trials comorbidity permitted	# MM clinical trials with ≥1 related term(s) in exclusion criteria	% MM clinical trials comorbidity excluded
Mental health comorbidities	8	0.28%	68	2.34%
Substance abuse comorbidities	4	0.14%	121	4.16%
Mental health or substance abuse comorbidities	12	0.41%	179	6.16%

Table 3. Number of multiple myeloma clinical trials (among the 2908 total searched) that mention one or more terms related to mental health and substance abuse comorbidities in their eligibility criteria.

Search Terms in Multiple Myeloma Clinical Trial Eligibility Criteria:

(Based on interventional trials initiated between 1990 and 2020.)



(Source: www.clinicaltrials.gov)

Figure 1. Comparison of inclusion and exclusion frequencies of grouped terms related to mental health and substance abuse in MM clinical trials.

Results and Discussion

The results indicate that those with substance abuse disorders were over 30 times more likely to be excluded from MM clinical trials than those without substance abuse concerns, establishing a 96.88% exclusion rate among substance abuse-related terms. Similarly, mental health terms elicited a 90.10% exclusion rate in MM clinical trials and were over nine times as likely to be excluded from clinical trials. Substance abuse and mental health terms were collectively

identified in the inclusion criteria of 14 studies compared to the exclusion of similar terms in 215 studies, yielding a 6.11% inclusion rate.

Patients with MM appear to have a relatively high occurrence of mental health and substance abuse concerns. Even so, the majority of clinical trials have failed to observe the effects of treatments in MM patients with such conditions. Based on the data found and presented in Table 3, alcoholism, substance abuse, and psychosis appear to be the most infrequently investigated co-conditions in MM clinical trials. Additional research should be established to better understand the relationship between MM and mental health conditions while simultaneously aiming to delay disease progression which includes MM patients with alcohol or substance abuse concerns. Further research could establish more effective multi-faceted treatment methods to address mental health concerns corresponding with MM and other chronic diseases.

References

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