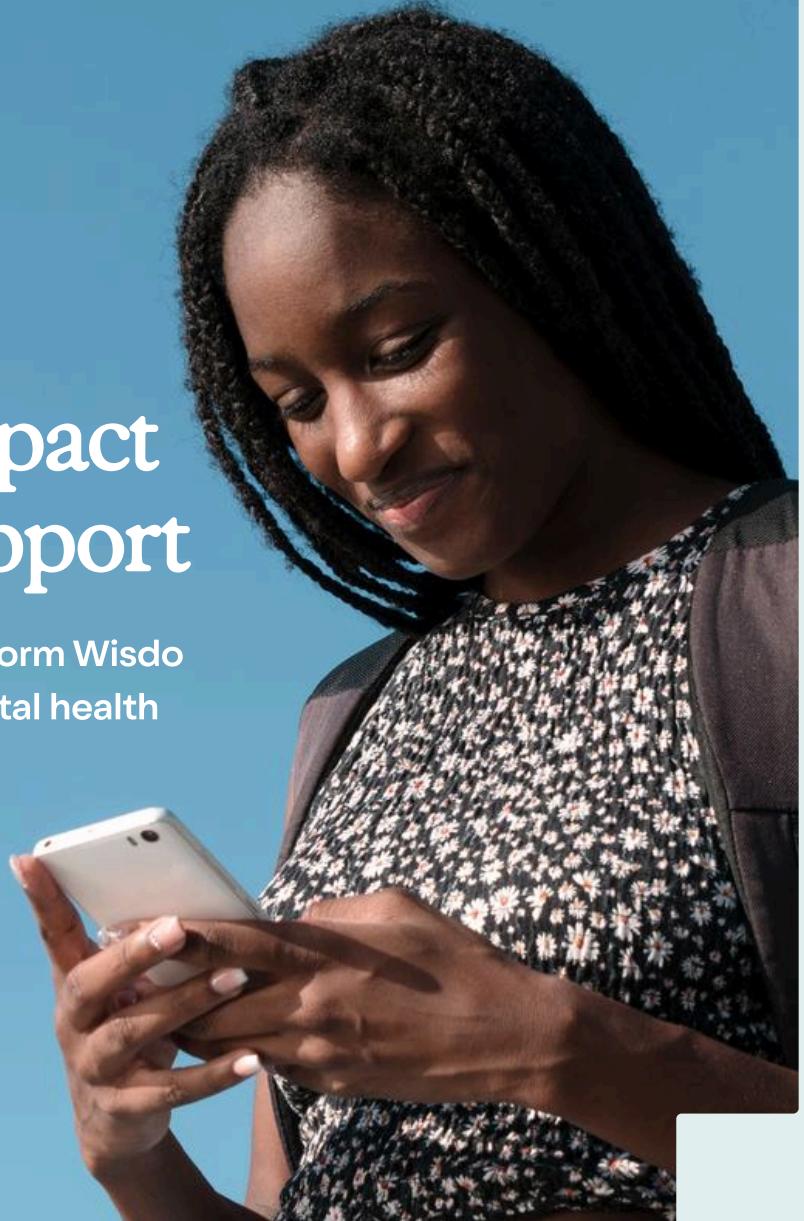


Evaluating the impact of virtual peer support

How the AI-assisted peer support platform Waldo Health affects user sentiment and mental health

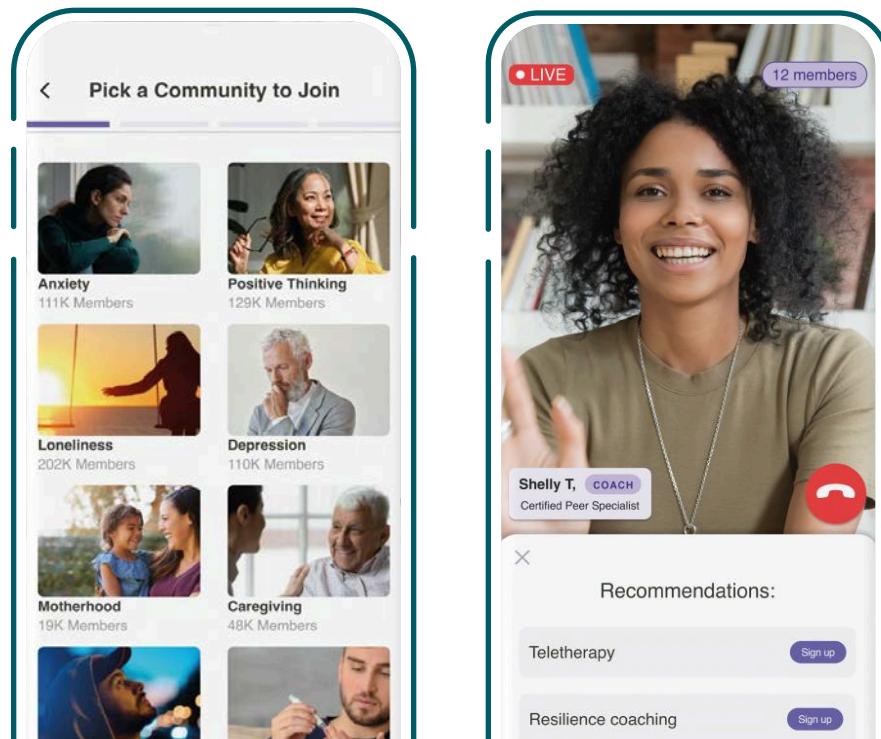


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Loneliness and social isolation are significant public health crises, correlating with adverse mental and physical health outcomes including increased risk of depression, anxiety, and chronic disease.¹ Loneliness has a health impact comparable to smoking 15 cigarettes a day² and results in billions of dollars in avoidable medical spending, including an estimated \$6.7 billion in annual Medicare costs.³ Digital interventions leveraging peer support offer a scalable strategy to mitigate this epidemic.

About Wisdo Health

Waldo Health is a clinically-validated digital peer support and social health platform designed to foster social connections and improve emotional well-being. The platform uses Artificial Intelligence (AI) for precision matching, connecting members to trained peers based on shared life experiences and specific needs, to provide emotional support and companionship. Members also receive group coaching to build resilience and sense of purpose and referrals to relevant clinical and social support resources when needed. Multiple peer-reviewed studies published in the Journal of Medical Internet Research (JMIR) have demonstrated statistically and clinically significant reductions in loneliness, depression, and anxiety in people using Waldo.⁴⁻⁵



RESEARCH OBJECTIVES

Does engagement on Waldo lead to improvements in mental health?

The linguistic expression of emotion is a recognized indicator of an individual's mental health state and research has shown that sentiment derived from text-based conversation is associated with clinical outcomes.⁶ The primary objectives of this analysis are:

1 To evaluate whether engagement on the Waldo platform leads to a measurable change in user sentiment about mental and physical health.

2 To determine if improvements in a Natural Language Processing (NLP) derived measure of sentiment correlate with clinically relevant improvements in mental health outcomes.

Methods

To understand how members' emotional tone changed over time, we used Google Cloud's Natural Language API to calculate sentiment scores (-1 to +1) from their de-identified messages in the community. Message themes were identified using HDBSCAN (Hierarchical Density-Based Spatial Clustering of Applications with Noise), to cluster messages into 27 meaningful categories.

For this analysis, we focused on messages in the "Mental and Physical Health & Medical" category, including those about anxiety, depression, stress, physical health issues such as chronic illness or pain, medication and therapy experiences, sleep and fatigue, and general health behaviors such as nutrition, exercise, self-care, and recovery.

Sentiment scores were measured over a three month evaluation period for members who sent four or more messages in our category of interest over at least 30 days. Proportion of improvement in sentiment scores and proportion of users who remained active on the platform were measured.



Next, to assess clinical mental health outcomes, a survey comprising items from validated standardized measures was administered at three monthly timepoints. The following scales were used and proportion of change was calculated:



Loneliness

UCLA Loneliness Scale (UCLA-3)⁷ measures an individual's subjective feelings of loneliness and social isolation.



Depression

Patient Health Questionnaire-2 (PHQ-2)⁸ assesses the presence and severity of anhedonia and depressed mood, the two core symptoms of depression, over the past two weeks.



Anxiety

Generalized Anxiety Disorder 7-item scale (GAD-7),⁹ specifically the single item (GAD-1) assessing anxiety frequency: "Over the past 2 weeks, how often have you been bothered with feeling nervous, anxious, or on edge?" This item was scored from 0 (not at all) to 3 (nearly every day).



Health-Related Quality of Life (HRQOL)¹⁰

Assesses "Mentally Unhealthy Days." This validated measure captures information on the mental health status of individuals and on the impact of health status on quality of life. It includes: "Thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"

Demographics

The final dataset included 351 members who generated 80,714 de-identified messages between January 2024 and June 2024.

Age		Gender		Race/Ethnicity		Social Vulnerability Index (SVI) ¹¹	
18–29	25%	Female	56%	White	64%	High	25%
30–39	25%	Male	38%	Black	12%	Medium-High	28%
40–49	14%	Non-Binary	3%	Latino	10%	Medium-Low	17%
50–59	12%	Other	4%	Asian	3%	Low	11%
60+	22%			Alaska/Native	1.1%		
				Other	11%		

Sentiment assessment

To ensure sentiment could be meaningfully assessed and aligned with survey data, analyses included only members who completed surveys at all three timepoints.

To determine whether changes in sentiment were related to clinical improvements, we used Spearman's Rank Correlation to compare sentiment change with changes in depression, anxiety, loneliness, and quality-of-life scores over the same period, and applied a False Discovery Rate (FDR) correction.

 **52%** increase in sentiment after three months

meaning they talked more positively about their mental and physical health, with scores improving from -0.17 to -0.10 .

AVERAGE SENTIMENT SCORE MONTHS 1-3



Subtopic sentiment trends

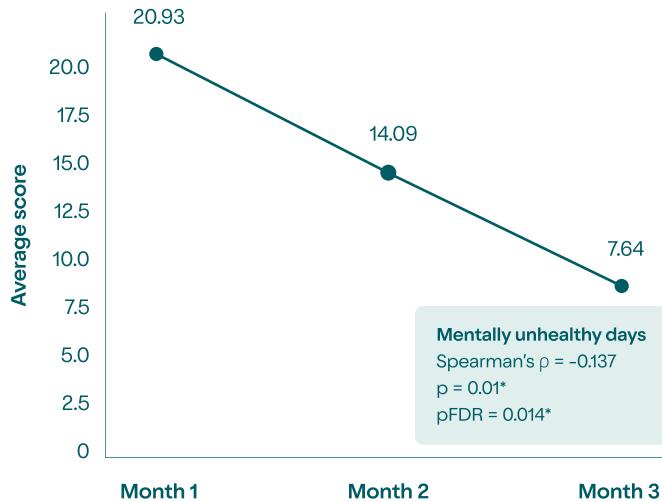
The Mental and Physical Health cluster includes three sub-categories. Sentiment improvements ranged from 24% for messages about anxiety and stress to 116% for messages on counseling services including therapy. This may indicate the potential of peer support to address the stigma associated with seeking therapy and increasing the likelihood of relevant members to enroll in therapy.

Subtopic	Description	Month 1	Month 3	% Change
Counseling Services	Messages about therapy, counseling sessions, peer support, or other interventions	-0.06	0.01	+ 116%
Depression	Messages expressing feelings of sadness, hopelessness, or managing depressive symptoms	-0.28	-0.18	+ 35%
Anxiety & Stress	Messages describing nervousness, panic, or chronic stress	-0.23	-0.17	+ 24%

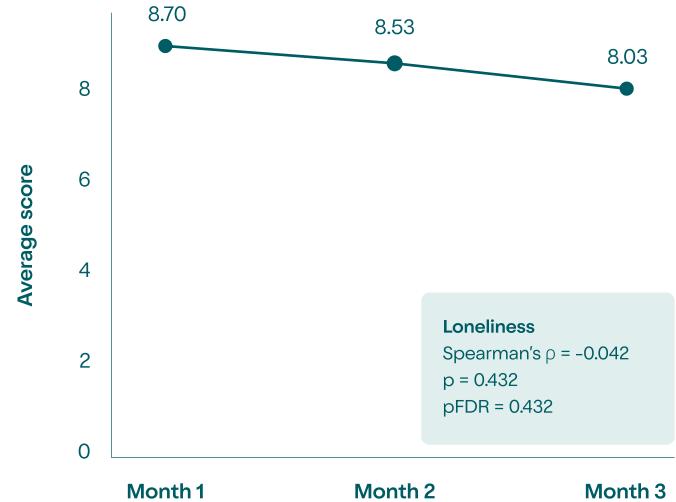


Mental health assessment trends

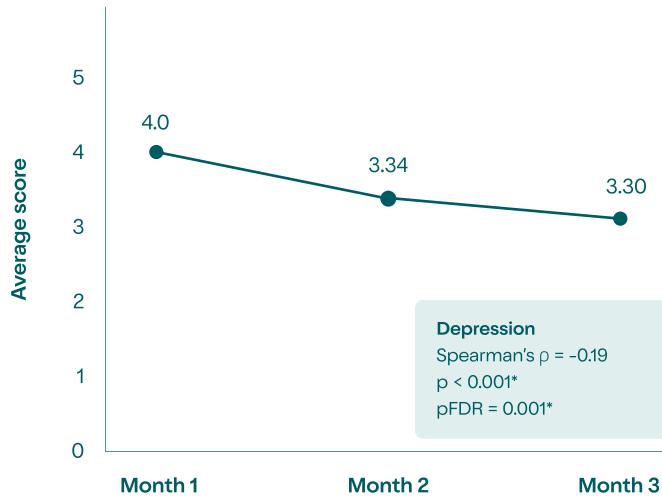
Poor mental health decreased by 63.5%



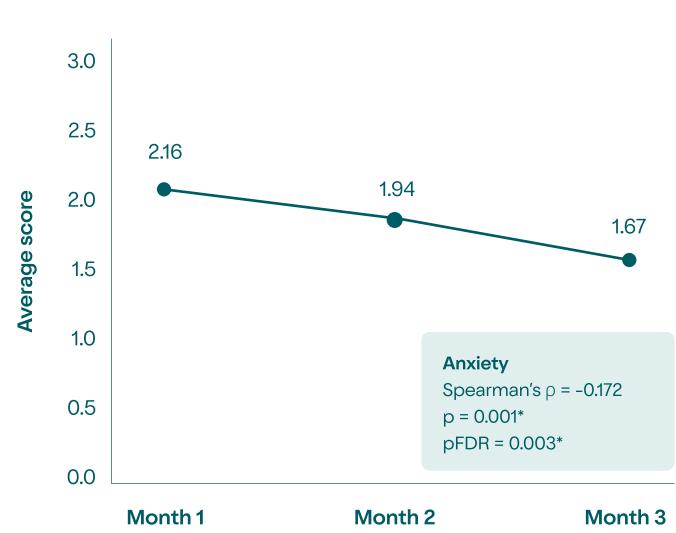
Loneliness decreased by 7.7%



Depression decreased by 22.5%



Anxiety decreased by 22.7%



*indicates statistically significant at $p < 0.05$

The association between **increases in sentiment and decreases in depression, mentally unhealthy days, and anxiety** was significant, suggesting that as users' sentiment improved, mental health symptoms also improved.



Conclusion

The Wisdo platform's unique combination of AI-driven precision peer matching and personalized engagement is effective. Members' sentiment improved by 52% over three months, reflecting a shift toward more hopeful, constructive discussions about their health. Sentiment in counseling and therapy-related conversations improved the most (116%), suggesting that peer support may help reduce stigma and increase openness to care.

Together, these findings show that Wisdo's peer-support model delivers measurable improvements in both emotional expression and clinically validated mental health outcomes. They also demonstrate that sentiment can serve as a reliable, real-time signal of member well-being. These outcomes position Wisdo as a scalable, cost-effective digital solution that can meaningfully address the detrimental impact of loneliness and social isolation on health outcomes, engagement rates, and total cost of care.

Interested in learning more or partnering with us?

Reach out to info@wisdo.com



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