Psychosocial mediators of the association between distress related to COVID-19 and physical activity among rural cancer survivors

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Background and Purpose

- **Rural cancer survivors face many health disparities**, including **higher mortality rates** rates versus survivors residing in urban areas.
- **Rural adults** experience higher pandemic-related disparities with **higher COVID-19 mortality rates**. Rural cancer survivors already experience increased health barriers including less access to resources such as: transportation, insurance, access to quality care, higher education, financial support, and tend to be older than rural cancer survivors.
- During the COVID-19 pandemic, **rural cancer survivors** reported **higher psychosocial distress** and lower quality of life, as well as **lower** levels of adequate **physical activity (PA)**.
- Higher psychosocial distress is associated with physical inactivity, both leading to worse health outcomes.
- Previous studies have looked at the association of increased COVID-19 distress and physical activity.
- However, the **association is still unclear in rural cancer survivors**, as well as **whether psychosocial wellbeing could mediate** this association.

The **purposes** of this study were to:

1. To explore associations between **distress related to COVID-19 and physical activity** in rural cancer survivors.
2. To explore associations between **psychosocial wellbeing and physical activity** in rural cancer survivors.
3. To explore **potential psychosocial mediators** of the association between distress related to COVID-19 and physical activity in rural cancer survivors.

HYPOTHESIS: We hypothesized that higher COVID-19 distress and poorer psychosocial wellbeing would be associated with lower physical activity in rural cancer survivors and that psychosocial wellbeing may partially mediate the association between distress and physical inactivity.

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Methods

Participants

- Rural cancer survivors from central Pennsylvania that participated in a Partnering to Prevent and Control Cancer (PPCC) parent study (n=219) were invited via email in April 2020 to complete an additional questionnaire during the pandemic
- Those with working email addresses were sent an invitation and link to the online survey (n=195)
- Participants who completed the additional questionnaires during the COVID-19 pandemic were included in analyses (n=104)

Measures

Construct	Measure
COVID-19 Distress	Modified Impact of Event Scale-6 (IES-6)
Anxiety	Beck Anxiety Inventory (BAI)
Depressive Symptoms	Center of Epidemiological Studies Depression Scale (CES-D)
Perceived Stress	10-Item Perceived Stress Scale (PSS-10)
Negative Affect	Positive and Negative Affect Scales (PANAS)
Physical Activity	International Physical Activity Questionnaire (IPAQ)

Analyses

Linear regression models were used to explore associations between COVID-19 distress and physical activity and psychosocial wellbeing and physical activity, controlling for age, gender, BMI and education.

Meditation analyses included four single-mediator models to assess the indirect effects of COVID-19 distress on physical activity through:

- Anxiety
- Depressive symptoms
- Perceived stress
- Negative affect

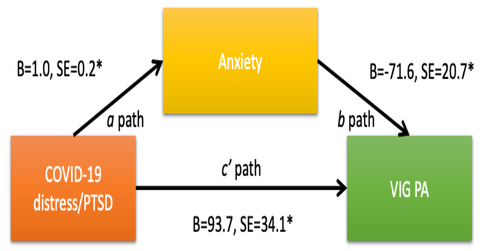
Table 1. Participant Characteristics (N=104)

Demographics	N (%)
Age (years)	61.9 ± 13.9
BMI (kg/m^2)	29.1 ± 7.5
Gender	
Male	36 (34.6)
Female	68 (65.4)
Education	
< Bachelors	38 (36.5)
= Bachelors	33 (31.7)
> Bachelors	33 (31.7)
Annual Income	
< $40,000	13 (12.5)
$40,000-79,000	33 (31.7)
≥ $80,000	53 (51.5)
Cancer Type	
Breast	27 (26.0)
Colorectal	12 (11.5)
Gynecological	17 (16.3)
Prostate	21 (20.2)
Other	27 (26.0)

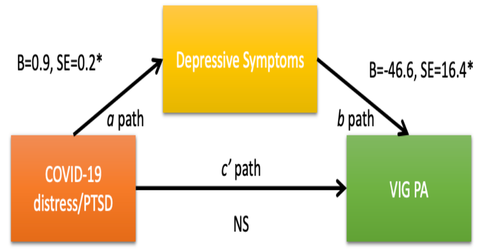
Results

Greater COVID-19 distress was associated with greater (walking) physical activity (B=80.8, SE=39.4, p=.043). Anxiety (B=-38.9, SE=17.6, p=.030), depressive symptoms (B=-33.0, SE=14.7, p=.028), and negative affect (B=-139.6, SE=67.9, p=.043) were all negatively associated with (moderate/vigorous) physical activity. Anxiety, depressive symptoms, and negative affect, (but not perceived stress) significantly mediated the effect of COVID-19 distress on physical activity in single-mediator models, when controlling for age, gender, BMI and education.

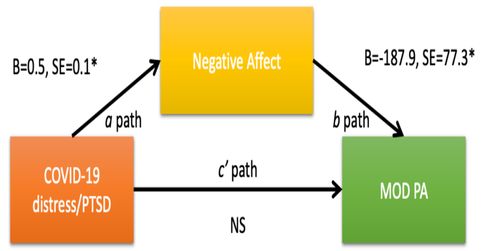
Anxiety



Depressive Symptoms



Negative Affect



Note: All figures adjusted for gender, age, BMI, and education

Table 2. Indirect Effects of Psychosocial Mediators on Physical Activity in Single-Mediator Models

Mediator	Effect	SE	95% CI (LL; UL)
Anxiety	-71.6	20.7	-122.8; -30.5
Depressive symptoms	-46.6	16.4	-79.2; -14.0
Negative affect	-187.9	77.3	-341.5; -34.3

Conclusions

Rural cancer survivors who reported greater COVID-19 related distress had poorer associated psychosocial wellbeing. Of those psychosocial wellbeing constructs, higher rates of anxiety, depressive symptoms, and negative affect individually showed significant association with lower rates of physical activity. These three acted as significant mediators for moderate/vigorous physical activity as well. Findings point to the need for psychosocial interventions that address pandemic-related distress to improve physical activity in rural cancer survivors. Additional studies are needed to better understand how to improve psychosocial wellbeing to reduce distress and increase physical activity to reduce cancer health disparities in rural communities.