

## Background

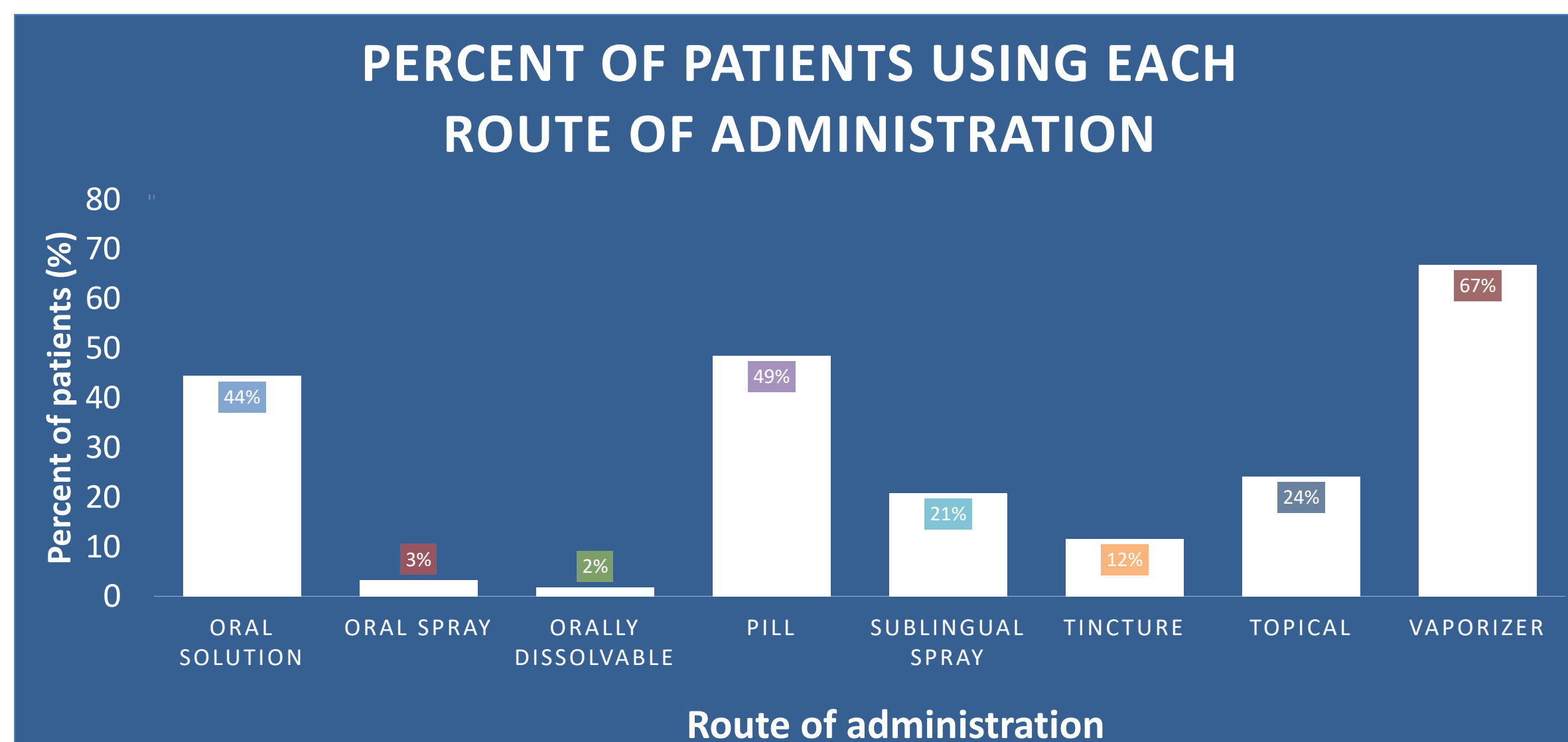
- 20% of cancer survivors report use of cannabis products.
- Cannabis products have been shown to reduce symptoms associated with cancer such as: anxiety, depression, fatigue, pain, lack of appetite, disturbed sleep, nausea, and vomiting.
- The optimal combinations of cannabinoids, routes of administration, and dosing are unknown.

## Objective

- To identify promising doses and cannabinoid products associated with improved symptoms in cancer survivors.

## Methods

- This retrospective analysis includes patient-reported data from 1721 patients enrolled in the Minnesota Medical Cannabis Program (MMCP) from 2015-2021 (Table 1).
- Symptom evaluation questions were completed by patients at the time of product purchase. Symptoms (anxiety, disturbed sleep, and others) were evaluated on a scale of 0-10:
  - Not present
  - As bad as you can imagine
- Total milligrams of THC and CBD used by each patient in their first four months of MMCP enrollment were used to calculate the THC:CBD ratio.
- Linear regression was used to evaluate the association of THC:CBD ratios with the 4-month average decrease in anxiety and disturbed sleep. Regression models were adjusted for gender, patient age, and initial symptom score.
- 8 forms of administration were used by MMCP patients:



Age (years)	N
0-17	
18-39	
40-49	
50-59	
60-69	
>=80	
<b>Gender</b>	
Female	845
Male	
Other	
<b>Race and Ethnicity</b>	
White	1516 88
Black	58 3
Native American	37 2
Asian	27 2
Other	20 1
Multiple	7 0
Unknown	4
No answer	
<b>Hispanic ethnicity</b>	
No	1640 95
Yes	32 2
No answer / unknown	49 3

- 50% of patients were male, and 49% were female.
- 88% of patients were White. 2% of patients were Hispanic.

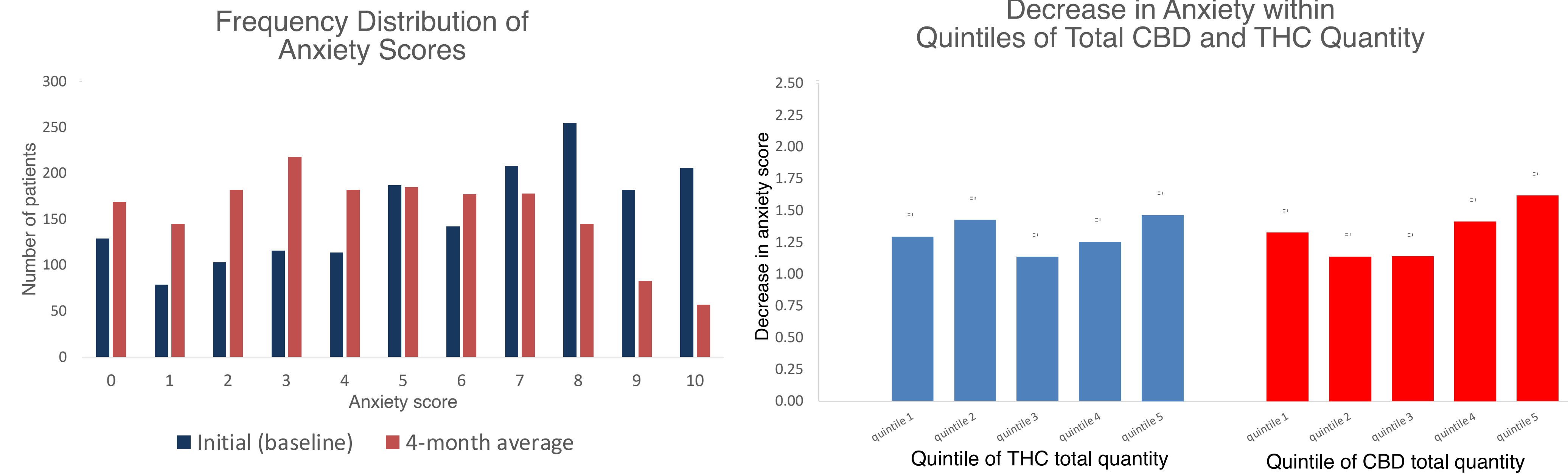
Data source: Minnesota Office of Medical Cannabis

### Limitations

- No assessment of the impact of cancer diagnosis factors (e.g., cancer site, diagnosis date, treatment)
- Access to the MMCP is limited to patients who receive a referral from certifying providers

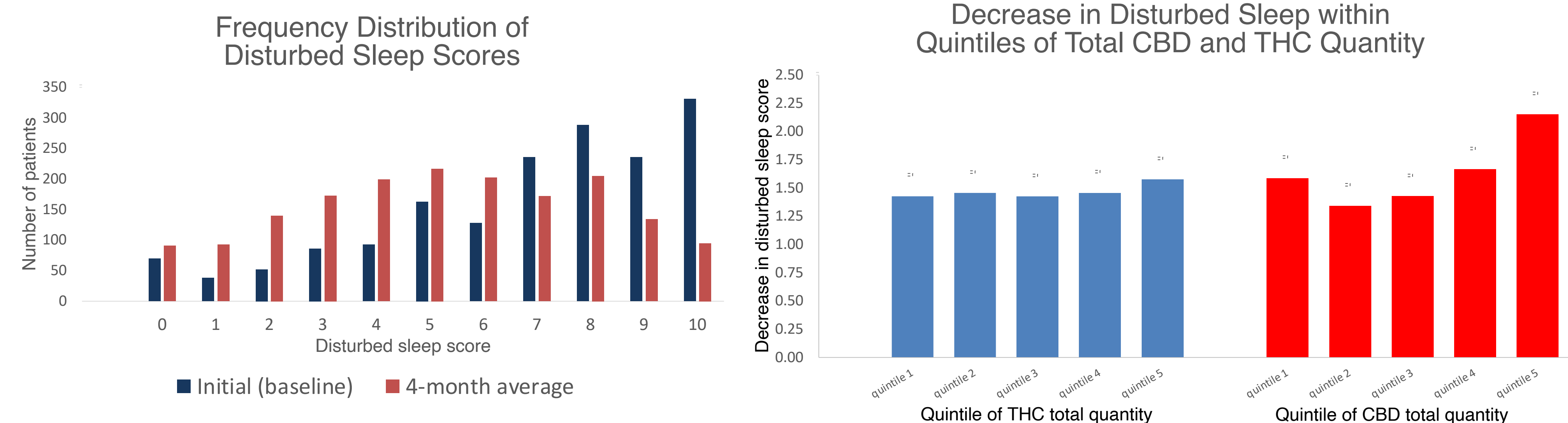
## Results

### Anxiety



- The median anxiety score (range 0-10) decreased from 6 to 4.86 after 4 months.
- A THC:CBD ratio of less than 1 was associated with a decrease in anxiety (p=0.06).
- There was an association between milligrams of CBD intake and a decrease in anxiety (p=0.002).

### Disturbed sleep



- The trend of THC:CBD ratio was associated with a 4-month average decrease in disturbed sleep score.
- The median disturbed sleep score (range 0-10) decreased from 7 to 5.5 after 4 months.
- A THC:CBD ratio of less than 1 was associated with a decrease in disturbed sleep (p<0.01).
- Milligrams of CBD intake was associated with a decrease in disturbed sleep score (p<0.001).

## Conclusions

- A lower THC/CBD ratio in cannabis products was associated with a larger decrease in anxiety and disturbed sleep for cancer survivors.

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