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Proposed Research Project Regulation of Human Intestinal Microbes to Treat and Manage Anxiety

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Proposed Research Project

Regulation of Human Intestinal Microbes to Treat and Manage Anxiety

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Introduction

- ❖ **Anxiety disorders** mental illnesses characterized by significant feelings of anxiety and fear ¹
- ❖ ~284 million in the world and 40 million in U.S. ¹
- ❖ There are many different types of Anxiety disorders (Figure 1.)



Figure 1. Different Types of Anxiety Disorders

Symptoms

- ❖ Worry
- ❖ Insomnia
- ❖ Nausea
- ❖ Trembling
- ❖ Sweating
- ❖ Irritability
- ❖ Panic

Causes

- ❖ Brain chemicals
- ❖ Genetics
- ❖ Environment
- ❖ **Cooccur**
- ❖ Sleep disorders
- ❖ Depression
- ❖ Chronic Pain
- ❖ IBS

What is the Problem?

Medications

Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs) ²

- Not instant release
- Bipolar disorder and social anxiety

Selective Serotonin Reuptake Inhibitors (SSRIs) ²

- Not instant release
- OCD and PTSD

Benzodiazepines²

- Most commonly used
- Short term treatment and quick
- Anxiety/panic attacks

Tricyclic Antidepressants ²

- Chronic pain
- When SNRIs and SSRIs do not work
- GAD and panic disorders



https://www.healthplace.com/anxiety-panic/anxiety-disorders/anxiety-disorder-treatments-are-effective

Side Effects

- Weight gain
- Nausea
- Insomnia
- Sexual dysfunction
- Hypertension
- Diarrhea
- Irritability
- Flu-like symptoms
- Dry mouth
- Blurry vision
- Urinary retention

Major Problems

- Dependency
- Addiction
- Tolerance
- Trigger depression
- Suicidal thoughts and actions

Specific Aim

Recent Research

- ❖ Connection between microbiota in the human gut and their function in specific regions of the brain ³⁻⁶
- ❖ Imbalances gut microbiota has a direct relationship with anxiety disorders⁷

Modify communication and function

- Hypothalamus-pituitary-adrenal axis ⁸
- NF-κB pathway expressions of cytokines ⁹
- Gut-brain axis ¹⁰

Probiotics

- ❖ Live microorganisms
- ❖ Fermented foods (yogurt) and in dietary supplements and beauty products ¹¹
- ❖ Similar to the “good” microbiota that live in the human body

Probiotics

- ❖ Food ingredients that stimulate activity and growth of bacteria in the gut
- ❖ Found in asparagus, artichoke, banana, garlic, onions, whole wheat foods, oats, and soybeans ¹²



Aim

- ❖ Examine regulation methods with probiotics and prebiotics for improvement in Anxiety Disorders
- ❖ Examine which method is more effective

Hypothesis

- ❖ Regulation of bacteria in the gut with probiotics and prebiotics will significantly decrease Anxiety Disorders and their related symptoms
- ❖ Prebiotics will have a greater effect on anxiety than probiotics

Research Plan

- ❖ Use ~200 participants
- ❖ Medical Outcomes Study Questionnaire SF-36 Health Survey ¹³

Questionnaires for assessing symptoms

- HADS ¹⁸
- STAI¹⁹
- BAI ²⁰
- HAM-A²¹

Removal from study

- Allergies
- Pregnant
- Using antibiotics
- Using nutritional supplements

Collecting results

- Urine testing for cortisol concentrations
- Use competitive ELISA with a DU 530 Beckman spectrophotometer ¹³
- Normal distribution of variables with the Kolmogorov-Smirnov test ¹³
- Chi squared test for categorical data and a student t-test for continuous data
- 2 probiotics and 2 prebiotics (Figure 2.)

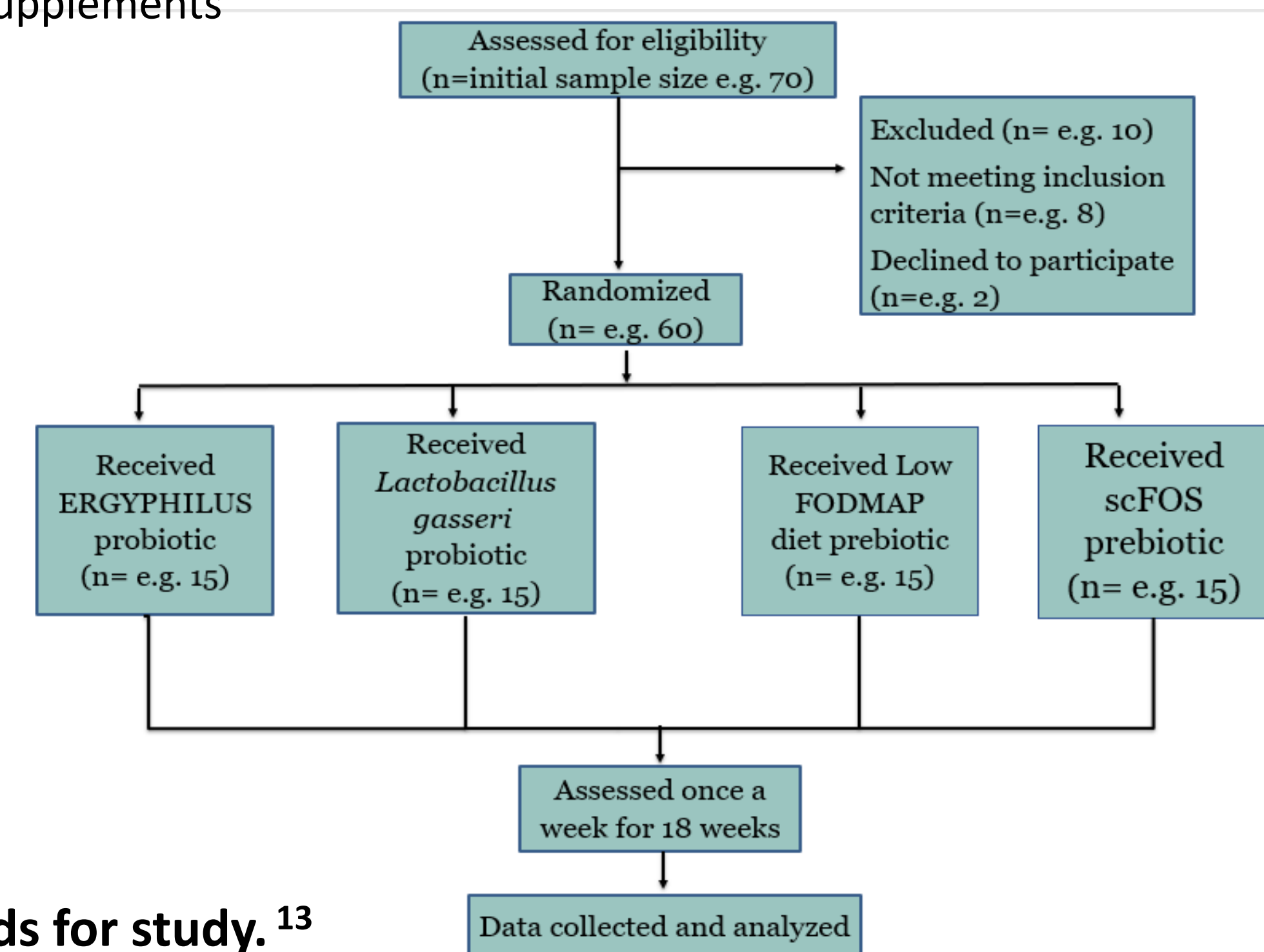
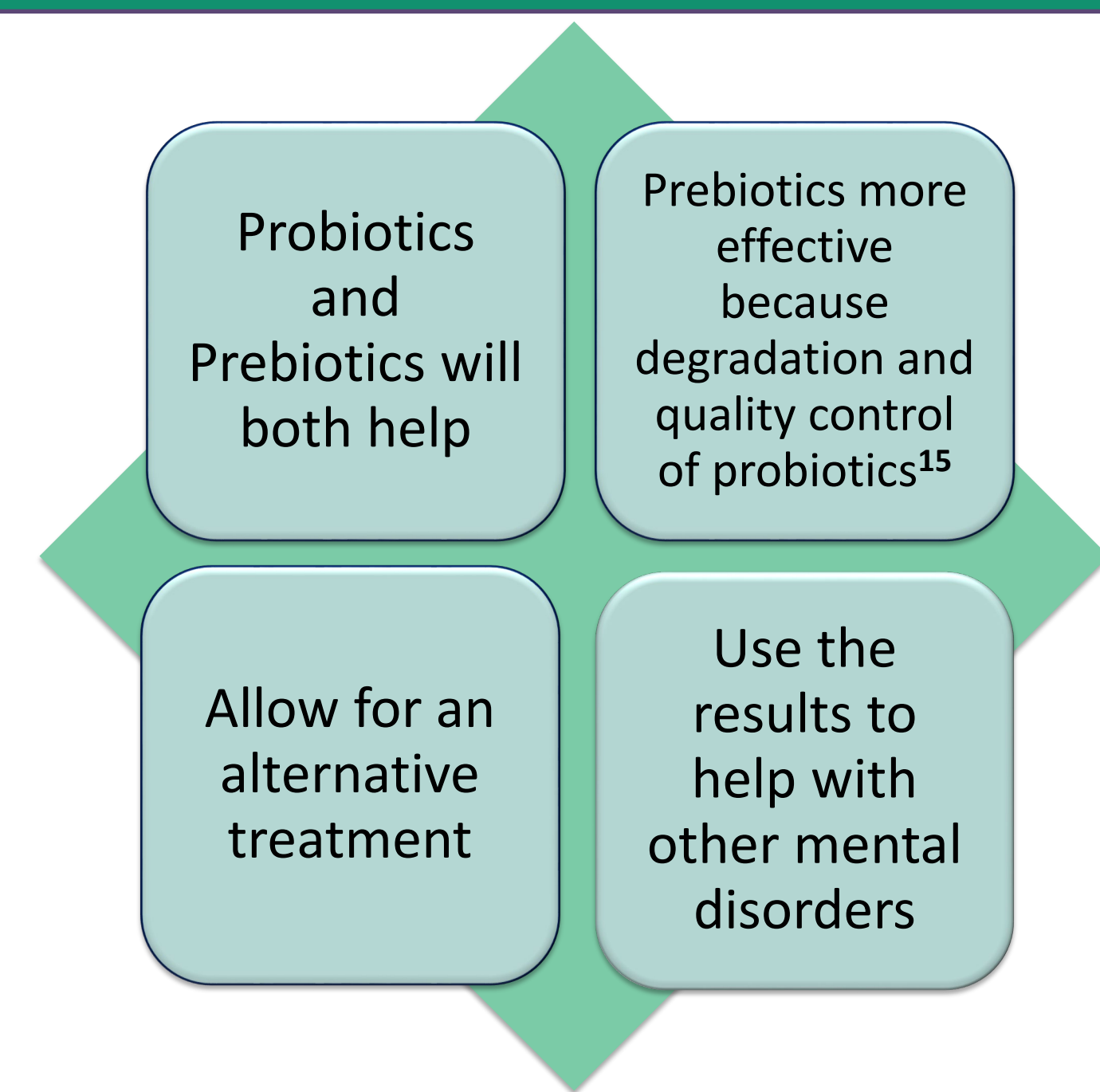


Figure 2. Methods for study. ¹³

- Given details, schedule, and instructions of the treatment
- Progress checked once a week for 18 weeks

Potential Conclusions



Importance

- ❖ Anxiety Disorders are the most common mental illness in America ¹
- ❖ It is imperative that there is a successful long-lasting treatment available
- ❖ Help lower cooccurring disorders and diseases
- ❖ I am hoping that my proposed research can provide an alternative treatment and help people better manage their Anxiety Disorders

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