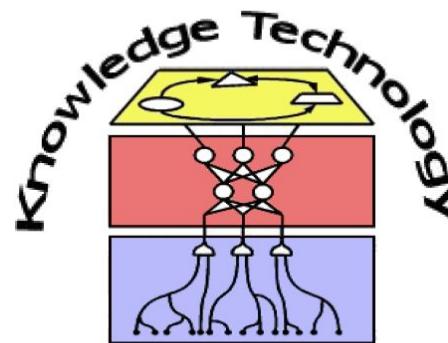


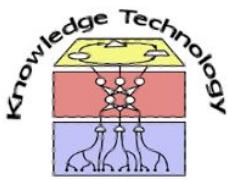
Research Methods

Assignment 7: Research Paper Review

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Outline

- Therapeutic Effects of Intercessory Prayer (STEP) in Cardiac Bypass Patients
 - Overall Study
 - Hypotheses
 - Experiment Design
 - Experiment Design: Findings
 - Statistical Approach
 - Statistical Approach: Findings
 - Study Analysis
 - Experiment and Conclusion
 - General Review

Therapeutic Effects of Intercessory Prayer (STEP) in Cardiac Bypass Patients

Intercessory prayer is widely believed to influence recovery from illness, but claims of benefits are not supported by well-controlled clinical trials. Results have been a mixed bag, with 2 studies proving benefits of intercessory prayer while the other 2 suggesting no effect.

Herbert Benson, MD along with other authors, attempted to find a conclusive evidence if intercessory prayer influences better recovery from the illness or not.

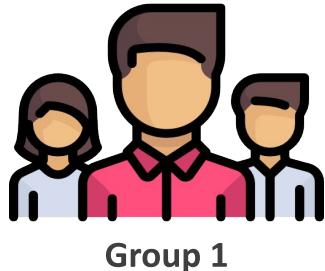


Hypotheses

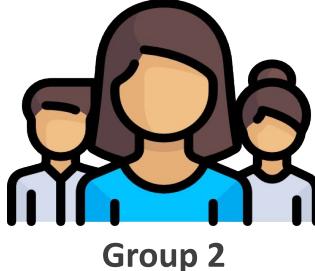
- H_0 Intercessory prayer has a beneficial effect on the well-being of the cardiac patients.
- H_1 Intercessory prayer has no effect on the well-being of the cardiac patients.



Experiment Design



Group 1
Uncertain - Received Prayer



Group 2
Uncertain - Unreceived Prayer



Group 3
Certain - Prayer Received

- All the patients had non-emergent CABG.
- All steps of the process were approved by the Review Board.
- Specific permissions were taken from the Doctors as well.
- **Blinding:** Nurses were blinded about the groups of the patient.
- **Randomization:** Patients are assigned to different groups randomly using Opaque Sealed Envelope technique.
- **Religious beliefs not considered:** Experiment designed to not include religion

Experiment Design: Findings

▪ Multiple Groups and their Comparison:

- **Group 1 v/s Group 3:** This checks the effect of *Certainty v/s Uncertainty*.
- **Group 1 v/s Group 2:** This checks for the *Placebo effect*.
- However, no discussion on why the study was done with these comparisons.
- **Group 4 (Missed - Received Prayer):** Patient is certain, he/she will not receive the prayer.

▪ Unregulated Prayer:

- List of patients was sent to the Churches via fax.
- No information if all the patients received the prayer or not.
- Patients with different ethnicity also received Catholic Prayer.
- Patients who were not supposed to receive the prayer, received it for 1-5 days.
- Patient praying for himself/herself was not considered



▪ Conduct of Surgery:

- No information about who did the surgery, Pathologist or Cardiothoracic Surgeon.
- This could have caused more complications.

Experiment Design: Findings

- **Inappropriate Randomization Technique:** Opaque sealed envelope is prone to tampering [1].
- **Various prayer start days:**
 - Night before surgery: 588 and 587 participants in Group 1 and 3 respectively
 - Same day as surgery: 5 and 5 participants in Group 1 and 3
 - 1-5 days after surgery: 2 participants in Group 3
- **Unusual prayer conditions:** Prayer was done anonymously (Usually participant's name, age and family members are known) and new sentences were added to the prayer
- **Religious beliefs not considered:**
 - Experiment designed to not include religion.
 - However, participants were asked if they believe in spiritual healing.
 - Only Catholic and Protestant churches were involved as prayers.
- **God cannot be accessed with human parameters:** If God is infinite so is α and β .



Statistical Approach

- **Independent Variables:**

- **Independent Variables:**
 - Spiritual Belief of the patient to heal
 - Knowledge of patient about receiving the prayer.

- **Dependent Variables:**

- **Dependent Variables:**
 - Well being of the patient.
 - Rate of postoperative complications.
 - Death of the patient.

- **Controlled Variables:**

- **Controlled Variables:**
 - Religious Sentiments
 - Frequency of prayer
 - Amount of prayer



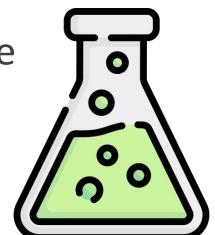
Statistical Approach: Findings

- **Independent Variables:** A lot of independent variables were not considered
 - Daily prayer habits
 - Frequency of visiting a religious place
 - Religious diversity
 - Willingness to receive a prayer
- **Extraneous Factors:** These are the factors which could have affected the overall experiment and were not considered before conducting the experiment:
 - If the person is qualified to provide Intercessory Prayer.
 - Family Members praying for the patient.
 - Doctors praying before the surgery



Experiment Analysis and Conclusion

- **Experiment design contains multiple flaws** that could have affected the overall result significantly.
- **No explanation on the results:**
 - Researchers had no explanation on that phenomena that Group 3, who were assured to receive prayer, had the most percentage of complications after surgery
 - Researchers claim this finding as by chance, which could mean that the researchers were being biased as after conducting a large study, the researches could have said that there were complications.
 - Similar to Group 3, Group 1 also received the prayer and was the group with most complications after Group 3. This also points that the well being could not have been by chance.
- Only **one statistical test** has been done.
- **Harmful Effect:** Patients having complication despite of being certain to receive the prayer could have a negative psychological effect.
- There is no mention on why so less religious organizations participated.
- Similarly, there is no mention about why more than half of the patients approached denied to take part in the experiment.



General Review

- The paper gives a good account of the research.
- The goal is clearly stated and some of the tools they used are known to us. Also, the procedure and the methods are described in detail.



General Review

- The paper fails to provide any conclusive evidence despite being such a large study.
- There are multiple trade-offs including the comparisons between the groups. The authors make this comparison but do not discuss why it was done this way and what was the rationale behind it.
- No account of **pilot study** is mentioned.
- No reason is mentioned on why only people with only cardiac illness are chosen for the study and not any **other illness**



Thank you for your attention



Literature:

- [1] Torgerson, D. J., & Roberts, C. (1999). Randomisation methods: concealment. *Bmj*, 319(7206), 375-376.