Thesis Project Portfolio

Enhancing Slow Wave Sleep in Older Adults Patients and Alzheimer's Disease Patients

(Technical project)

The Effect of Unequal Demographic Representation in Medical Studies on Health Disparity

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

This thesis explores the significance of how unequal demographic representation in medical research, specifically within the context of sleep studies, has contributed to health disparity. The goal of this paper is to conduct a detailed examination of the participant demographic characteristics at the University of Virginia (UVA) Sleep Clinic, informing how bias might be present historically and currently. Historically, white males from economically advantaged backgrounds have been disproportionately represented in medical research which has led to medical technologies, treatment decisions, and even outreach efforts to continue to cater to this group. Such biases have led to optimized treatment and technology for the most privileged portion of the population, which only further exacerbates the present health disparity among ethnic minorities.

The STS research question used to focus the scope of the paper is "What are the factors that shape how sleep studies are conducted at the University of Virginia Sleep Clinic?" The answer to the research question was obtained through a literature review for historical context and interviews at the UVA Sleep Disorder Center in order to better understand the nuances that have led to this disparity in representation.

This research utilizes a sociotechnical approach in order to begin to understand the factors that contribute to this phenomenon. These factors include societal trends, technological artifacts, and the goals of relevant groups in the equation. Drawing on the Social Construction of Technology (SCOT) framework from Pinch and Bijker's work in "*The Social Construction of Facts and Artefacts,*" the work argues that sleep study methodologies and treatments are not solely the result of scientific discoveries, but have been shaped by the values of the relevant

groups involved in research; particularly those funding, performing, participating, and profiting from it. This perspective which is argued throughout the paper is essential for understanding medical research bias and how it has been socially constructed to disproportionately benefit certain groups over others. In order to address these health disparities, this project emphasizes the necessity for an intentional and inclusive approach to conducting sleep studies by incorporating diverse demographics during data collection. The application of the SCOT framework highlights the importance of deconstructing these socially constructed artifacts by incorporating better-representing data into sleep research. This approach aims to create outcomes that cater to underrepresented groups such as women and ethnic minorities with higher risk factors for diseases such as Alzheimer's Disease.

The research also includes a literature review and interviews with medical professionals working at the University of Virginia (UVA) Sleep Disorder Center and Sleep Clinic, aiming to better understand the demographic breakdown of the patients involved in treatment and research there. It is argued that policy changes, incentives for inclusive research, and further funding into demographically inclusive outreach are all necessary steps towards fostering a research community that equally represents all who it aims to benefit.

The thesis sheds light into the nuanced approach that needs to be taken in order to prevent further proliferation of systemic medical bias. By challenging the concept that this bias can be mitigated by solely training doctors to avoid their own personal biases, this work contributes to efforts to reduce healthcare disparities.