Baylor Medical Student Review

Issue 1
Spring 2025

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On the Inaugural Issue

Dear Reader,

We founded the *Baylor Medical Student Review* to promote scholarship and education throughout all of medicine. The *BMSR* serves as a medium for trainees at all levels to share their scholarly work and address critical matters in the medical field through various academic and creative means. Early involvement in research has been shown to correlate with continued post-graduation research involvement and interest towards academically-oriented careers[1-5], and there is no shortage of interest in academics among students at Baylor College of Medicine. We also hope that this medium may be an avenue for students to engage in scholarly activities, particularly for those who might not have otherwise had the opportunity to participate.

In this inaugural issue, we present to you original work written by trainees, including undergraduates, medical students, and residents, from all around the country. We thank our team of editors and peer reviewers who have contributed countless hours towards reading outstanding submissions, writing detailed reviews, and learning the publishing process. We appreciate the efforts of everyone who submitted their thoughtful work for our consideration. We are grateful for the opportunity to share your articles in the inaugural issue of the Journal.

We have many exciting endeavors planned as we work to expand both the reach and the readership of the Journal by creating more partnerships and embarking on new initiatives. We have a strong belief that the Editor-in-Chief-designate and future Executive Leadership will continue the legacy of the *Baylor Medical Student Review* for years to come.

Sincerely,

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Contents

Issue 1

ORIGINAL RESEARCH

Attitudes, Beliefs, Awareness, and Practice of Mind-Body Interventions among Pregnant Women

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ABSTRACT

Background: Mind-body interventions (MBIs) hold promises for managing mental health symptoms during pregnancy but are not widely practiced by pregnant people. This study aimed to describe the distribution of attitudes, beliefs, awareness, and practice of MBIs such as yoga and meditation among socioeconomically and ethnically diverse pregnant women.

Methods: This cross-sectional study was conducted from July 2019 to February 2020, involving 77 pregnant women who were actively recruited from obstetric clinics and pregnancy support groups in Texas. Online survey data were collected, and associations between variables were tested using the Chi-Square test of independence.

Results: The frequency of practice of MBIs was significantly correlated with self-identified race ($p = 0.028$); the perceived benefit of MBIs in prior and current pregnancies ($p = 0.022$ and $p<0.001$, respectively); and prior practice of MBIs during pregnancy ($p = 0.048$). The perceived benefit of MBIs was significantly correlated with the perceived benefit of exercise in current pregnancy ($p = 0.011$); current frequency of practice of MBIs ($p<0.001$); practice of MBIs in prior pregnancies ($p = 0.019$); and perceived benefit of MBIs in prior pregnancies ($p<0.001$).

Conclusion: Prior experience with MBIs and their perceived benefits emerged as key determinants of their continued use and perceived efficacy in subsequent pregnancies. This study provides a foundation for future research to define the perceptions of pregnant women of MBIs, which can be used to develop and evaluate MBI programs for pregnant people.

Keywords: Perceptions, MBIs, Yoga, Meditation, Pregnancy

Introduction

Half of adults in the United States use complementary and alternative medicine, with mind-body interventions (MBIs) being the most common form.[1] These Eastern healing practices focus on brain-mind- body connection and their effects on health. These include meditation, yoga, tai chi, and breathing interventions — all of which may be helpful for mental health. Consequently, MBIs have received increasing attention among women during pregnancy, a time of joy but also increased risk of stress, depression, and anxiety.[2] Perinatal depression is a major problem in the United States that affects up to 23% of pregnant women, with higher rates documented among women from low-income and racial/ethnic minority backgrounds.[2]

Prior studies indicate a positive effect of MBIs on health outcomes for women during and after pregnancy. Yoga practice resulted in stress reduction, reduced occurrence of pregnancy complications such as preterm labor and intrauterine growth restriction, and improved labor outcomes such as reduced self-perceived pain and shortened labor duration.[3,4] Furthermore, mindfulness-based cognitive therapy, which involved mindfulness meditation and cognitive behavioral strategies, led to a significant improvement in depression symptom levels and a lower rate of relapse/recurrence through six months postpartum compared to the control.[5] A national U.S. survey found that 84% of depressed pregnant women would consider using a complementary health approach for weight and/or stress management, and more than 50% of the women would try yoga.[2]

Adoption of MBIs varies across sociodemographic groups. Yoga practice is greatest among women and those with higher socioeconomic status.[6] Specifically, a systematic review found that yoga practice in the U.S. has been consistently linked with identifying as Caucasian and, to a lesser extent, Asian.[6] However, the degree to which this is true in a pregnant population is unknown. This study aimed to identify the attitudes, beliefs, awareness, and practice of MBIs such as yoga and meditation among ethnically, racially, and economically diverse pregnant women. The study addresses the hypothesis that pregnant women's perceptions of MBIs would differ by ethnicity and race, household income, pregnancy trimester, self-perceived mental health, and practice of MBIs. With MBIs originating in Asian cultures[7], we sought to describe MBI perceptions and practice rates in subsets of Asian origins (e.g., Central, South, Southeast, and West Asian). Additionally, a descriptive comparison was made between the practice and perceptions of MBIs versus exercise (e.g., walking, running, swimming, strength training).

Materials and Methods

Participants

A total of 79 women completed the survey. To be included in the study, participants had to self-identify as pregnant females above the age of 18 years and live in the greater Houston area. Participants who completed the survey but did not fulfill the above inclusion criteria were excluded from the study analyses. The following response entries were dropped: "no" for pregnancy (2 respondents had this response). This resulted in a total of 77 women fully completing the survey.

Study Design

The Institutional Review Board at the University of Houston, Division of Research reviewed and approved the study protocol. This cross-sectional study was conducted from July 2019 to February 2020, involving 79 pregnant women who were actively recruited from obstetric clinics, community clinics, and pregnancy support groups in the Houston, Texas, metropolitan area. Before completing the survey, the participants provided informed written consent.

Assessment Methods and Instruments

The study design included an online survey. Prior to initiating the survey, participants were provided a thorough background of MBIs to understand its definition and context before answering the questions. The following statements were included in the background: "MBIs are part of Eastern healing practices and focus on the relationships among the brain, mind, and body and their effects on health. These include meditation, yoga, tai chi, and breathing interventions." Sociodemographic information such as race (self-categorized), age, education, household income, number of children, marital status, the closest metropolitan area of residence, political ideology, and current pregnancy trimester was obtained from the respondents. Survey questions regarding perceptions and frequency of MBIs were adapted from the Pregnancy and Wellness Survey.[2] Survey questions regarding mood and emotional health were adapted from the Hamilton Depression Rating Scale[8].

Outcome Measures

The main outcome was to define the distribution of perceptions and frequency of MBIs among a sample of pregnant women. The researchers wanted to determine whether the frequency and perceptions differed by sociodemographic factors, history of MBI practice, complications in current pregnancy, and other related

questions.

Statistical Methods

All data was collected anonymously. Only surveys that had been completed fully and respondents that met the inclusion criteria were analyzed. The Chi-Square test of independence was used to determine if there is a significant relationship between two nominal (categorical) variables. The data was organized into contingency tables for respective independent and dependent variables. The program for this analysis consisted of the Anaconda 2022.10 framework, utilizing the SciPy and pandas packages, written with Python 3.10 on a JupyterLabs environment. The frequency of each category for one nominal variable was compared across the categories of the second nominal variable. The Chi-Square test compared expected values for each category versus the observed values.

The results of each contingency table returned the p-value, degrees of freedom, chi-squared statistic value, chi-squared critical value, and whether the statistical significance was true or false. Statistical significance for each contingency table was determined true or false by comparing the chi-squared statistical value to the chi-squared critical value. The critical value was calculated with an alpha value of 0.1. The p-value had a two-tailed significance level ≤ 0.05. There is statistical significance when the chi-squared statistic is greater than the chi-squared critical value and vice versa.

Results

Demographics

Participant demographics are summarized in **Table 1**. Among 77 participants, the majority (43%) were aged 25-30, with 10% aged 18-24. Racial distribution was even across categories (Caucasian, African American, Hispanic, Asian/Pacific Islander. Among Asians, 13% identified as East Asian, 47% as South Asian, and 40% as Southeast Asian. Approximately half of the participants held a bachelor's degree and reported household incomes over $80,000. Nearly half had one child, while others had none or more than one. Most were married and lived in Houston. Roughly 10-20% of the participants each identified as somewhat liberal, liberal, independent, somewhat conservative, conservative, or preferred not to answer, with none identifying as extremely liberal and one as extremely conservative. Most were in their third trimester (55%), followed by the second (31%) and first (14%).

Descriptors of Survey Responses

Table 2 describes the participants' responses to the questions on practice and perceptions of MBIs. Most

women (87%) indicated that they were not experiencing complications in their current pregnancy. Regarding psychological complications (i.e., prolonged stress, insomnia, frequent sadness/pessimism), approximately 56% of the participants reported that they were experiencing one or multiple of these issues. For the women who experienced any of the three symptoms above, 8% sought counseling/therapy. Approximately 92% of the sample currently exercised (ranging from daily to 1-3 times per week) in contrast to 48% who practiced MBIs, while 44% of the sample engaged in both exercise and MBIs. Approximately 28% of the women practiced MBIs in previous pregnancies, and 27% believed that MBIs were beneficial to their health. Most of the other women were either never pregnant before (29%) or never engaged in MBIs (38%). With current exercise practice, 86% of women exercising believed that exercise was benefiting their health. With current MBI practice, 92% of women practicing believed that MBIs benefitted their health. In both the exercise and MBI perceptions, none of the women indicated that these practices harmed their health. Furthermore, a large majority of the women's physicians (78%) had not suggested using MBIs.

Correlations of Frequency of MBIs

Table 3 details the correlation between the frequency of MBIs to the participant demographics and other survey questions. The frequency of practice of MBIs was significantly correlated with self-identified race (p = 0.028); the perceived benefit of MBIs in prior and current pregnancies (p = 0.022 and p<0.001, respectively); and prior practice of MBIs during pregnancy (p = 0.048).

There were no statistically significant relationships between the frequency of MBI practice with age, education, household income, number of children, marital status, political ideology, and trimester. There were also no statistically significant relationships between the frequency of MBI practice with complications in current pregnancy; frequency of current exercise; perceived benefit of exercise in current pregnancy; physician recommendations of MBIs; experiences of prolonged stress/insomnia/frequent sadness in current pregnancy; and seeking therapy if experiencing prolonged stress/insomnia/frequent sadness in current pregnancy.

Race-Ethnicity Category

Specifically, regarding the significant correlation between the frequency of practice of MBIs with self-identified race, rates of never practicing MBIs varied between self-identified race with 67% (10 of 15) of those who identified as Asian (50% of whom were

from South Asia, 40% from Southeast Asia, and 10% from East Asia), 61% (11 of 18) of those who identified as Hispanic, 57% (12 of 21) of those who identified as African American, and 33% (6 of 18) of those who identified as Caucasian. Rates of practicing MBIs one to three times per week also varied with 33% (6 of 18) of those who identified as Caucasian, 43% (9 of 21) of those who identified as African American, 27% of those who identified as Asian (50% of whom were from South Asian and 50% from Southeast Asia), and 28% (5 of 18) of those who identified as Hispanic. Rates of practicing MBIs four to five times per week also varied with 11% (2 of 18) of those who identified as Caucasian, 6% (1 of 18) as Hispanic, 7% (1 of 15) as Asian (East Asian), and none who identified as African American or other Asian categories. Rates of practice MBIs daily also varied between self-identified race with 22% (4 of 18) percent of those who identified as Caucasian, 6% (1 of 18) as Hispanic, and none who identified as African American.

Correlations of Perceptions of MBIs
Table 4 detailed the correlation between the perceived health benefit of MBI to the participant demographics and other survey responses. The perceived benefit of MBIs was significantly correlated with the perceived benefit of exercise in current pregnancy ($p = 0.011$); current frequency of practice of MBIs ($p<0.001$); practice of MBIs in prior pregnancies ($p = 0.019$); and perceived benefit of MBIs in prior pregnancies ($p<0.001$).

There were no statistically significant relationships between the perceived health benefit of MBIs with age, education, household income, number of children, marital status, political ideology, race/ethnicity self-identification, and trimester. There were also no significant relationships between the perceived health benefit of MBIs with complications in current pregnancy; frequency of current exercise; physician recommendations of MBIs; experiences of prolonged stress/insomnia/frequent sadness; seeking counseling/therapy if experiencing prolonged stress/insomnia/frequent sadness.

Discussion
While there are potential benefits of practicing MBIs to manage or prevent depression and other mental illnesses in pregnancy, relatively little is known about contemporary pregnant women's perceptions, awareness, and practice of MBIs. The current study explored the attitudes, beliefs, awareness, and practice of MBIs among culturally and socioeconomically diverse pregnant women. Further, the frequency of practice and the perceived benefit of the MBIs in women's current pregnancy were compared with sociodemographic variables and other survey

questions. The results revealed that the frequency of practice and the perceived benefit of the MBIs in women's current pregnancy were compared with sociodemographic variables and other survey questions. The results revealed that the frequency of practice of MBIs was significantly associated with self-identified race and ethnicity, the practice of MBIs in a previous pregnancy, and the perceived benefit of MBIs in previous and current pregnancies. Additionally, the perceived health benefit of MBIs during the current pregnancy was significantly associated with the perceived benefit of exercise in the current pregnancy; frequency of practice of MBIs in previous and current pregnancies; and perceived benefit of MBIs in prior pregnancies.

This study found that more women engaged in exercise than in MBIs. However, a majority of those who exercised and/or practiced MBIs indicated that these activities benefitted their health, with a slightly greater percentage among those practicing MBIs. This aligned with the literature, which suggested that MBIs, specifically yoga interventions, were equally or more beneficial to exercise in most outcome measures including depression, attention, and concentration.[9,10] Interestingly, a novel finding of this study indicated that most of the women's physicians had not recommended MBIs. This may be due to a lack of knowledge of potential benefits and how to provide patient education on the topic or a consequence of limited time available during a medical care visit. Notably, most women who experienced emotional complications during their pregnancy did not pursue counseling or therapy. This observation suggests that MBIs could potentially serve as an accessible and effective first-line approach for managing mild emotional symptoms in this population. This is a finding that lends further exploration.

Overall, the frequency of practice and the perceived benefits of MBIs were significantly correlated with each other. This suggests that pregnant women who practice MBIs in previous pregnancies and/or believe that MBIs are beneficial to their health practice MBIs more frequently in their current pregnancy. Furthermore, the perceived benefit of MBIs was significantly related to the perceived benefit of exercise. Other studies support this observation, indicating that pregnant women, especially those with mental health conditions, are more likely to practice or consider practicing MBIs if they are aware of the associated benefits.[11]

Interestingly, neither the frequency nor perceived benefit of MBIs were significantly related to pregnancy complications. This is in contrast to present-day findings that suggest that MBIs help to reduce antenatal

Participant Characteristics (N = 77)	% Frequency (N)
Age	
18-24	10% (8)
25-30	43% (33)
31-35	30% (23)
36 or above	17% (13)
Race/ethnicity self-identified:	
Caucasian	23% (18)
African American	27% (21)
Hispanic	23% (18)
Asian or Pacific Islander	19% (15)
Central Asia (Tajikistan, Uzbekistan, Kazakhstan, Turkmenistan, Kyrgyzstan)	-
East Asia (China, Mongolia, North Korea, South Korea, Japan, Hong Kong, Taiwan, Macau)	13% (2)
South Asia (Sri Lanka, Bangladesh, India, Afghanistan, Pakistan, Bhutan, Nepal, the Maldives)	47% (7)
Southeast Asia (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor Lester, Vietnam, Christmas Island, Cocos Islands)	40% (6)
Western Asia (Georgia, Armenia, Azerbaijan, Turkey, Cyprus, Syria, Lebanon, Israel, Palestine, Jordan, Iraq, Iran, Kuwait, Bahrain, Qatar, Saudi Arabia)	-
American Indian	0 (0)
Other/Prefer not to answer	8% (5)
Highest Education:	
High School/GED	5% (4)
Some College	12% (9)
Associate degree	6% (5)
Bachelor's degree	51% (39)
Graduate degree	26% (20)
Household Income:	
<$40,000	7% (5)
$41,000 - $50,000	10% (8)
$51,000 - $60,000	7% (5)
$61,000 - $70,000	10% (8)
$71,000 - $80,000	8% (6)
>$80,000	58% (45)
Number of children:	
0	27% (21)
1	46% (35)
2	17% (13)
3 or more	10% (8)
Marital Status:	
Single/Never married	13% (10)
Divorced/Separated/Widowed	0
Married	87% (67)
Closest metropolitan area of residence:	
Houston	90% (69)
Austin	3% (2)
Dallas	7% (5)
San Antonio	0 (0)
Corpus Christi	0 (0)
El Paso	0 (0)
Lubbock/Amarillo	1% (1)
Brownsville	0 (0)
Ideology:	
Extremely liberal	0
Liberal	18% (14)
Somewhat liberal	14% (11)
Independent	18% (14)
Somewhat conservative	20% (15)
Conservative	13% (10)
Extremely conservative	1% (1)
Prefer not to answer	16% (12)
Trimester:	
1st (0 -13 weeks)	14% (11)
2nd (14-26 weeks)	31% (24)
3rd (27+ weeks)	55% (42)

Table 1. Sociodemographic variables in the sample.

Question	Responses, % (n)				
	Yes	**No**	**Maybe**	**Do not know**	**N/A**
Are you experiencing complications in your current pregnancy?	9% (7)	87% (67)	4% (3)	-	
If you are exercising, do you believe exercise is benefiting your health?	83% (64)	-	3% (2)	6% (5)	8% (6)
If you are practicing MBIs, do you believe they are benefiting your health?	44% (34)	-	3% (2)	1% (1)	52% (40)
Have you practiced MBIs in your previous pregnancy?	28% (22)	38% (29)	3% (2)	3% (2)	28% (22)
If you practiced MBIs in your previous pregnancy, did you find the intervention benefiting your health?	27% (21)	5% (4)	1% (1)	-	66% (51)
Has your doctor suggested using MBIs?	18% (14)	78% (60)	1% (1)	3% (2)	
Have you experienced the following during your pregnancy: prolonged stress, insomnia/difficulty sleeping, and/or frequent sadness and pessimism?	56% (43)	43% (33)	-	1% (1)	
If you experienced any of the three symptoms above, have you sought counseling/therapy?	8% (6)	35% (27)	3% (2)	12% (9)	43% (33)
	1-3 times a week	**4-5 times a week**	**Daily**	**Never**	
How often are you currently exercising (30 minutes per session)?	71% (55)	9% (7)	12% (9)	8% (6)	
How often do you practice MBIs, such as yoga and meditation?	34% (26)	5% (4)	9% (7)	52% (40)	

Table 2. Participant responses to survey questions on frequency of practice and perceptions about mind-body and exercise practices.

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Independent Variable	χ2 statistic	Degrees of Freedom	p-value
Age	6.15	9	0.72
Race/ethnicity, self-identified	27.12	15	**0.028***
Education	5.78	12	0.93
Household income	14.10	15	0.52
Number of children	4.88	9	0.84
Marital status	2.55	3	0.47
Ideology	22.08	18	0.23
Trimester	7.58	6	0.27
Are you experiencing complications in your current pregnancy?	3.73	6	0.71
How often are you currently exercising (30 minutes per session)?	16.77	9	0.05
If you are exercising, do you believe exercise is benefiting your health?	7.29	6	0.30
If you are practicing MBIs, do you believe they are benefiting your health?	56.51	6	**<0.001****
Have you practiced MBIs in your previous pregnancy?	21.18	12	**0.048***
If you practiced MBIs in your previous pregnancy, did you find the intervention benefiting your health?	19.46	9	**0.022***
Has your doctor suggested using MBIs?	12.22	9	0.20
Have you experienced the following during your pregnancy: prolonged stress, insomnia/difficulty sleeping, and/or frequent sadness and pessimism?	10.71	24	0.99
If you experienced any of the three symptoms above, have you sought counseling/therapy?	6.63	9	0.68

Coefficients in **bold** are significant. *p-value < 0.05, **p-value < 0.01, ***p-value < 0.001

Table 3. Correlation between "How often do you practice MBIs, such as yoga and meditation?" to the following independent variables.

Independent Variable	χ2 statistic	Degrees of Freedom	p-value
Age	10.345	6	0.11
Race/ethnicity self-identification	8.01	10	0.63
Education	7.32	8	0.50
Household income	6.40	10	0.78
Number of children	3.87	6	0.69
Marital status	0.24	2	0.89
Ideology	4.00	12	0.98
Trimester	2.82	4	0.59
Are you experiencing complications in your current pregnancy?	2.17	4	0.70
How often are you currently exercising (30 minutes per session)?	6.82	6	0.34
If you are exercising, do you believe exercise is benefiting your health?	13.11	4	**0.011***
How often do you practice MBIs, such as yoga and meditation?	56.51	6	**<0.001*****
Have you practiced MBIs in your previous pregnancy?	18.29	8	**0.019***
If you practiced MBIs in your previous pregnancy, did you find the intervention benefiting your health?	28.53	6	**<0.001*****
Has your doctor suggested using MBIs?	4.04	6	0.67
Have you experienced the following during your pregnancy: prolonged stress, insomnia/difficulty sleeping, and/or frequent sadness and pessimism?	22.76	16	0.12
If you experienced any of the three symptoms above, have you sought counseling/therapy?	5.28	6	0.51

Coefficients in **bold** are significant. *p-value < 0.05, **p-value < 0.01, ***p-value < 0.001

Table 4. Correlation between participant perceived benefit of mind-body intervention practice with other demographic and mind-body practice characteristics.

stress, anxiety, and depressive symptoms.[4,12–14] The difference in findings may be due to the limited sample size or lack of control of other variables. Individuals could have resorted to other stress-reducing practices, such as religiosity or social support. However, based on this study, it is possible that if pregnant women are aware of the potential benefits of MBIs, there is an increased likelihood of frequency of practice.

The only sociodemographic variable that was significantly correlated with the frequency of practice of MBIs was self-identified race/ethnicity. In concordance with Park and colleagues,[6] MBIs may not be practiced across diverse cultures despite their benefits. However, Park and colleagues[6] attributed increased MBI practice to higher socioeconomic status. In contrast, this study did not identify a significant relationship between household income with either frequency of practice or perceived benefit of MBIs. A plausible reason for this is that MBIs can be practiced at home, often with minimal cost, through free online resources or self-guided techniques[15]. As a result, individuals from various income levels may have equal access to MBIs, diminishing any relationship between income and frequency or perceived benefit. Self-identified race was not significantly associated with the perceived benefit of MBIs. This indicates that there may be a different, unexplored barrier regarding the differences of self-identified race with the frequency of practice of MBIs. Future qualitative research is necessary to determine what the barrier is.

Contrary to our hypothesis, a majority (71%) of those who identified as Asian never practiced MBIs in their current pregnancy. The rest of the sample only practiced MBIs one to three times per week. Our results indicate that although MBIs originated in the Asian subcontinent, the data does not necessarily show that Asian American women practice more than other American racial-ethnic groups. Some reasons may include the stigma surrounding mental health in many Asian cultures, which could extend to MBIs.[16] These practices may seem Westernized, commercialized, or distanced from their original spiritual contexts, making them less appealing or relatable to some Asian American communities. There may also be a lack of targeted outreach, educational efforts, or resources on MBIs that are culturally tailored for Asian American communities, particularly among those with limited English proficiency.[17]

This study has limitations that should be considered when interpreting the results. First, the small sample size (n=77) may not entirely represent the U.S. pregnant population as it may lack key demographic or clinical factors such as age, ethnicity, socioeconomic status, and health conditions that are representative of the U.S. pregnant population. Recruitment through obstetric clinics and pregnancy support groups may potentially exclude pregnant women who do not have access to or do not participate in such resources. However, the study's recruitment methods, while focused on specific resources, still capture a significant subset of the population that is highly relevant to the research objectives. There was also not a survey question that identified where each participant was recruited. Furthermore, a majority of the sample were married and had either a bachelor's or graduate degree, which is not nearly representative of the U.S., Texas, or Houston population. The sample also consisted of only urban, Texas residents, which makes it difficult to generalize the findings to pregnant women living in other states or countries. The study also relied on self-reported measures of practices, attitudes, and experiences, which may be skewed by social desirability or recall bias. However, these measures provide direct insight into participants' perceptions and behaviors, which are often inaccessible through other methods. There was also not a survey question that clarified which specific MBIs (e.g., yoga or meditation) the participants engaged in. Despite these limitations, this research is ultimately foundational, with subsequent work aimed at addressing inclusivity and representativeness.

Future research can confirm these findings and explore the barriers and facilitators to practicing MBIs among culturally diverse pregnant women utilizing a larger-scale study. In addition, future research should explore the effectiveness of MBIs in managing pregnancy-related symptoms in diverse pregnant women.

Conclusion

This study demonstrated a significant correlation between the frequency of MBIs and their perceived benefits, highlighting the potential value of MBIs in supporting maternal well-being. Additionally, self-identified race-ethnicity was significantly associated with the frequency of MBI practice, while perceived benefits of MBIs were linked to the perceived benefits of exercise, suggesting overlapping attitudes toward health-promoting behaviors. Importantly, household income was not significantly associated with either the frequency of practice or perceived benefit of MBIs, indicating that socioeconomic factors may not serve as a major barrier to engaging in these interventions. These findings lay the groundwork for future research to investigate the nuanced barriers and facilitators of MBI practice among pregnant populations. Such efforts are essential for developing culturally tailored MBI programs that

address diverse needs and enhance accessibility, ultimately promoting equitable maternal health outcomes.

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LETTER TO THE EDITOR

Ever the Optimist: The Relationship between Attitudes and Research Outcomes
In reply to Attitudes, Beliefs, Awareness, and Practice of Mind-Body Interventions among Pregnant Women

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Imagine you are at the office or school, and your teacher asks everyone to stand up and move around the room. You roll your eyes and chuckle under your breath as you play charades or untangle your arms in a silly team bonding exercise. You are not focused on learning teamwork or communication because you are embarrassed by the corny activity. Many times, we just go through the motions of some activity we do not believe in.

As an experienced practitioner of meditation, I sometimes meditate incorrectly. Perhaps it's due to distractions or feeling lazy; even when familiar with it and having seen its benefits, I sometimes cheat myself. However, imagine if you ask a stranger to do something they find silly, useless, or a waste of time. They may not do it correctly, if at all. Thus, researchers and clinicians must examine participants' perceptions of an activity such as mind-body interventions, which are activities that target both mental and physical health.[1] If participants believe in the intervention, they will put their heart into it, engaging actively rather than drifting off to thoughts of lunch. Thus, their positive perceptions may affect their benefit from treatment.

When investigating drug compliance, patients frequently do not take medications properly or adhere to treatment.[2] However, the same study showed patients who are not compliant falsely reported that they have taken their medication. This poses a problem for research studies, since some participants may seemingly derive no benefit from treatment, not because it did not work, but because they did not comply. Ensuring patients understand the positive benefits of medication improves treatment compliance in both behavioral and medication studies.[2] Additionally, this applies beyond research, in which industrial miners were more likely to comply with

safety procedures if they held a positive perception of the procedure.[3] If people are willing to risk injuries and death by cutting corners, imagine what research participants may do if they are not convinced the intervention will work.

This is especially important in behavioral interventions, which require not just physical compliance like in medication interventions, but mental compliance. It is simple to swallow a pill, and the medication will work whether you believe in it or not. However, some interventions, such as mind-body practices, require focusing the mind to impact health.[1] Thus, participants must actively and mentally engage with the mind-body intervention. Think of all the times you sat zoned out in class or a meeting, your head in the clouds, and you learned nothing. The same may hold for many participants, who grumble while going through the motions of the mind-body intervention without fully engaging with it.

Research shows that highly engaged students who adopt positive learning styles achieve better outcomes, even when attending the same lectures and completing the same projects as their peers.[4] In other words, our perceptions influence how we change and grow. Perhaps, by being convinced we will improve, we will take the intervention more seriously, dedicating our thoughts and efforts, thereby creating a self-fulfilling prophecy. For example, regarding mindfulness meditation, some may doubt its effectiveness and choose to sit passively and not even try. Others may seethe over their morning commute or ponder what is for dinner instead of fully engaging in the practice. Externally, they may appear to be participating and even claim they were. However, the truth is that they did not meditate. Some may cheat themselves like I do from time to time, while others may unknowingly take

the wrong mental approach. Because the intervention is mental in nature, it is hard for researchers to detect and control these differences. These participants who do not properly comply would be lumped in with compliant participants during statistical tests and analyzed as if they had complied, possibly affecting significance values. If the researcher hypothesizes that X leads to Y, then failing to complete X implies that achieving Y is unlikely. Per the researcher's very own hypothesis, the participant who does not comply should experience no benefit. Meanwhile, those who hold positive outlooks on meditation or any other treatment may fully and correctly engage with the intervention, thereby receiving the actual hypothesized treatment benefits. Thus, one's positive perception may influence the actual, measurable outcome of an intervention.

Other examples of positive outlook impacting intervention outcomes include palliative care, which prioritizes alleviating the negative effects of a disease rather than curing it. While palliative care does not directly treat the underlying illness, its focus on comfort and holistic support correlates with improved patient well-being and survival rates.[5] Similar benefits are observed in other chronic illnesses, where palliative and hospice care are associated with improved health outcomes compared to focusing solely on disease treatment.[6] Likewise, this may be why many interventions employ a placebo, as the expectation of a positive outcome sometimes leads to tangibly improved health outcomes.

Whether by improving treatment compliance or augmenting active engagement with an intervention, a positive outlook may impact research outcomes. Since mind-body interventions require easy to cheat and difficult to prove cognitive focus, it is especially important they evaluate participant perception prior to the intervention. Just as mind-body interventions argue that our mind can influence our physical health, perhaps our outlook on treatment interventions can influence the outcomes of treatment.

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Comparison of the American College of Cardiology/American Heart Association and the European Society of Cardiology/European Association of Cardio-Thoracic Surgeons Guidelines for the Evaluation and Management of Aortic Valve Stenosis

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Disclosures: The authors report no financial relationships or conflicts of interest regarding the content herein.

ABSTRACT

Background: Both the American College of Cardiology and American Heart Association (ACC/AHA), as well as the European Society for Cardiology alongside the European Association of Cardiothoracic Surgeons (ESC/EACTS) have published recommendations for the screening, diagnosis, treatment, and management of patients with Aortic Stenosis, as part of larger sets of guidelines related to valvulopathies. This manuscript aims to quantitatively and qualitatively compare recommendations from both groups.

Methods: To conduct the necessary analysis, the total number and content of recommendations as well as Level of Evidence (LOE) and Class of Recommendation (COR) for each recommendation was reviewed, in the context of both publications. Only recommendations in the sections exclusive to AS were reviewed. Chi-square tests were conducted to assess whether differences in COR and LOE distributions between the guidelines were statistically significant. A qualitative analysis was also performed.

Results: ACC/AHA guidelines included 37 AS-exclusive recommendations, while those created by ESC/EACTS contained 19. Chi-square tests revealed no statistically significant differences in the distributions of COR and LOE between the guidelines (p-values of 0.89 and 0.99, respectively). In sections exclusive to AS, ACC/AHA cited 229 publications in their guidelines, while ESC/EACTS guidelines cited 125. Qualitative analysis of recommendations identified several similarities and differences between both sets of guidelines, related to definition and classification, diagnostic evaluation, echocardiographic parameters used for assessment, serial testing/follow up, medical therapy, and interventions.

Conclusion: While observable differences were found between the guidelines, these differences do not reach statistical significance, suggesting that both sets of guidelines are broadly consistent in their approach to managing AS. Clinicians should adhere to guidelines from their region of practice to ensure standardized care in the management of AS.

Introduction

Recently, the American College of Cardiology and American Heart Association (ACC/AHA), as well as the European Society for Cardiology and the European Association of Cardiothoracic Surgeons (ESC/EACTS), have published updated guidelines regarding the management of patients with valvular heart disease. The latest valvular heart disease guidelines by ACC/AHA were published in 2020 and by ESC/EACTS in 2021. These updated guidelines suggest changes relevant to the treatment and screening of valvulopathies from the time of publication of previous versions, in 2014 and 2017 respectively. Modifications in both the American and European guidelines provided important recommendation updates for the management of aortic stenosis (AS). The aim of this manuscript is to compare the recommendations qualitatively and quantitatively for the management and screening of AS between the ACC/AHA and ESC/EACTS.

Materials and Methods

To create these guidelines, the guideline writing committees of both the ACC/AHA and ESC/EACTS performed an extensive review of the available literature and a panel of experts critically analyzed it. As a group, they weighed the recommendations and evidence available to provide a recommendation with a certain COR and LOE. The guideline writing committees for both the ACC/AHA and ESC/EACTS included healthcare professionals in cardiology involved in the care of valvular heart disease. They were selected based on a variety of factors, and represent various geographical regions, gender identities, races, ethnicities, biases, and clinical practice expertise. The working groups for creating the guidelines consisted of 15 members for the ACC/AHA, and 20 members for the ESC/EACTS. The ACC/AHA provided a complete policy with relationships with industry.

Source of Materials

The ACC/AHA valvular heart disease guidelines published in 2020 and the ESC/EACTS guidelines published in 2021 were downloaded from *Circulation* and the *European Heart Journal*, respectively. The total number of recommendations pertaining to AS, level of evidence (LOE), class of recommendation (COR), and overall content of the recommendations for the diagnosis and treatment of aortic stenosis were compared. These also included recommendations pertaining to both valvular heart disease (VHD), and mixed or combined valvular diseases that included or applied to aortic stenosis. For the purposes of our analysis, we considered only the sections exclusive to AS in both sets of guidelines. We defined

'AS-exclusive' recommendations as those that solely addressed aortic stenosis without consideration of other concurrent valvular diseases. Combined valvular conditions that included or pertained to AS were excluded. To ensure clarity, we performed a detailed review of each guideline section to isolate recommendations focused exclusively on AS.

Of note, although the breakdown of LOE and COR is the same across the two societies and allows for direct comparison, there are slight differences in the definitions and criteria for a given LOE or COR. The frameworks for classification and determination of LOE are summarized in **Table 1** and **Table 2**, respectively.

Comparisons and Statistical Analysis

The LOE, COR, and number of recommendations from the ACC/AHA and ESC/EACTS guidelines for AS were compared using chi-square tests to determine statistical significance. The COR and LOE data were extracted from both sets of guidelines and organized into contingency tables.

The chi-square test was chosen because it is a non-parametric statistical test that is appropriate for determining whether there is a significant association between categorical variables. The test was applied to the frequencies of each COR and LOE category within the two guidelines. A p-value of less than 0.05 was considered to indicate statistical significance.

A cursory quantitative analysis was also performed based on categorization of each recommendation as pertaining to "screening" (including initial diagnosis of AS, assessment of severity, and echocardiographic monitoring) or "treatment" (including medical therapy and procedures such as transcatheter aortic valve replacement (TAVR) or surgical aortic valve replacement (SAVR)). The number of citations, region of origin of citations, and percentage of citations that are shared between the two documents were also compared on a quantitative basis.

The content of the recommendations was compared qualitatively. Similarities and differences between the recommendations were compared, based on the following sections: 1) Definition and classification, 2) Diagnostic evaluation (including initial echocardiographic classification and follow-up, 3) Medical therapy options, 4) Choice of intervention, such as TAVR vs SAVR, and 5) Special Populations section of the ESC/EACTS guidelines was also analyzed; the ACC/AHA guidelines did contain have a corresponding section.

	American College of Cardiology / American Heart Association	European Society of Cardiology
Class 1 (Class I)	[Proposed treatment or procedure]: ● Is recommended ● Is indicated/useful/effective/beneficial ● Should be performed/administered ● Treatment A is recommended/indicated in preference to treatment B **OR** ● Treatment A should be chosen over Treatment B	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, [or] effective
Class 2a (Class IIa)	[Proposed treatment or procedure]: ● Is reasonable ● Can be useful/effective/beneficial ● Treatment A is probably recommended/indicated in preference to treatment B **OR** ● It is reasonable to choose treatment A over treatment B	Weight of evidence/opinion is in favor of usefulness/efficacy
Class 2b (Class IIb)	[Proposed treatment or procedure]: ● May/might be reasonable ● May/might be considered ● Usefulness/effectiveness is unclear or not well established	Usefulness/efficacy is less well established by evidence/opinion
Class 3 (Class III)	[Proposed treatment or procedure]: ● Is not recommended ● Is not indicated/useful/effective/beneficial ● Should not be performed/administered **OR is** ● Potentially harmful ● Known to cause harm ● Associated with excess morbidity or mortality*	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful

*ACC/AHA guidelines differentiate within Class III between treatments/procedures that have 'no benefit' (Benefit=Risk) and those that '[cause] harm' (Risk>Benefit)

Table 1. Class Of Recommendation (COR) comparison between ACC/AHA and ESC/EACTS guidelines.

	American College of Cardiology / American Heart Association	European Society of Cardiology
Level of Evidence A	● High quality evidence from more than one RCT ● Meta-analyses of high-quality RCTs **OR** ● One or more RCTs corroborated by high-quality registry studies	Data derived from multiple randomized clinical trials or meta-analyses.
Level of Evidence B	● Moderate quality evidence from one or more RCTs ● Meta-analyses of moderate quality RCTs **OR** ● Moderate quality evidence from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies ● Meta-analyses of such studies*	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of Evidence C	● Randomized or nonrandomized observational or registry studies with limitations of design or execution ● Meta-analyses of such studies ● Physiological or mechanistic studies in human subjects **OR** ● Consensus of expert opinion based on clinical experience**	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

*ACC/AHA guidelines differentiate within the LOE B category between LOE B-R (based on randomized studies) and B-NR (based on nonrandomized studies)

**ACC/AHA guidelines differentiate within the LOE C category between LOE C-LD (based on limited data) or C-EO (based on expert opinion)

Table 2. Level Of Evidence (LOE) comparison between ACC/AHA and ESC/EACTS guidelines.

Results

Number of Recommendations

The ACC/AHA and ESC/EACTS included a total of 37 and 19 recommendations for AS in the "aortic stenosis" section, respectively[1]. Only recommendations exclusive to the defined AS section (Section 3 in ACC/AHA guidelines and Section 5 in ESC/EACTS guidelines) were included; combined AS recommendations from other sections were excluded. A description of recommendations from each society based on class of recommendations and level of evidence was provided. Among the 37 AS-exclusive recommendations included in the ACC/AHA guidelines, no distinction between revised or new recommendations was made. Among the 19 AS-exclusive recommendations included in the ESC/EACTS guidelines, six were revised recommendations and two were new recommendations (updated from the 2017 guidelines).

Class of Recommendation (COR) and Level of Evidence (LOE)

In our analysis, we examined the guideline recommendations provided by ACC/AHA and ESC, which are categorized by the organizations themselves based on COR and LOE. These categories reflect the strength and quality of the evidence supporting each recommendation. The distributions of these recommendations are visually represented in **Figure 1**, allowing for a comparison of how each organization allocates its recommendations across these predefined categories.

A chi-square test was conducted to determine if the differences in Class of Recommendation (COR) and Level of Evidence (LOE) distributions between the ACC/AHA and ESC/EACTS guidelines were statistically significant. For the COR distribution, the chi-square value was 0.64, with a p-value of 0.89. This indicates that the observed differences in COR distribution between the guidelines are not statistically significant. Similarly, for the LOE distribution, the chi-square value was 0.02, with a p-value of 0.99, suggesting that the observed differences in LOE distribution between the ACC/AHA and ESC/EACTS guidelines are also not statistically significant. These findings suggest that while there are observable differences in the distributions of COR and LOE categories between the two sets of guidelines, these differences do not reach statistical significance.

Citations

The ACC/AHA 2020 guidelines cited a total of 229 publications in the exclusive AS section. The ESC/EACTS 2021 guidelines cited a total of 125citations in the exclusive AS section. Of these, 36 were shared citations. 77.29% of sources cited by ACC/AHA guidelines originated from American publications, while 27.2% originated from European publications, as depicted in **Figure 2**. This indicates a very similar distribution of sources between both publications.

Historical Guidelines

The ACC/AHA introduced their first guidelines for the management of valvular heart disease in 1998 and ESC/EACTS did so in 2007. Including the first sets of guidelines, ACC/AHA has published a total of four (1998, 2006, 2014, 2020) full guideline documents, and ESC/EACTS has published a total of four (2007, 2012, 2017, 2021) guideline documents (See **Figure 3**). The ACC/AHA has also published two (2008, 2017) guideline updates. The ESC/EACTS hasn't published any guideline updates so far, likely attributed to the full guideline document publishing frequency. Of note, the number of recommendations related to aortic stenosis provided by these guidelines has increased over the years, as detailed in **Figure 3**.

Discussion

The guidelines for valvular heart disease published by the ACC/AHA and ESC/EACTS are very comprehensive documents that provide practitioners with the necessary tools to diagnose and manage these conditions. As expected, given the different practices by geographical regions, the guidelines share several similarities but also differences in their recommendation approach, particularly for aortic stenosis, our subject of interest[1,2]. A detailed quantitative analysis of the guideline content for aortic stenosis was conducted. The chi-square tests completed for both Class of Recommendation (COR) and Level of Evidence (LOE) distributions revealed that the differences between the ACC/AHA and ESC/EACTS guidelines are not statistically significant (p-values of 0.89 and 0.99, respectively). This finding suggests that, despite some observable differences in how recommendations and evidence levels are categorized between these guidelines, these variations do not represent a significant divergence in clinical guidance.The lack of statistically significant differences supports the idea that both sets of guidelines are broadly consistent in their approach to managing aortic stenosis, even though they may present these recommendations differently. Below, a qualitative description of the similarities and differences in the definition, diagnosis, classification, medical therapy, and intervention approach is discussed. A section for miscellaneous similarities and differences is also included. **Table 3** offers a summary of the ACC/AHA guidelines, while **Table 4** summarizes the ESC/EACTS guidelines.
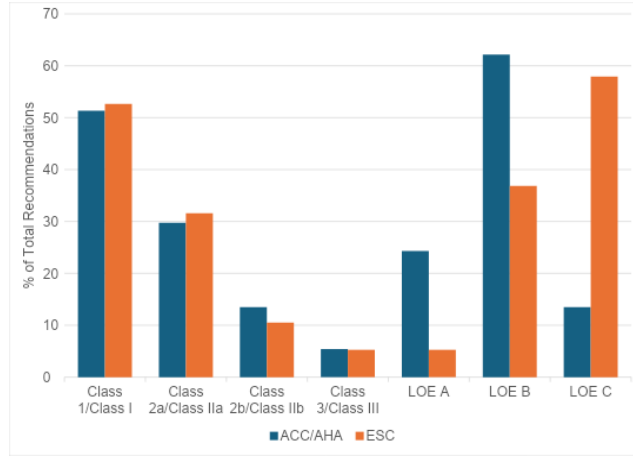
Figure 1. Comparison of COR and LOE groupings for recommendations exclusive to AS in latest guideline recommendations between ACC/AHA and ESC/EACTS.
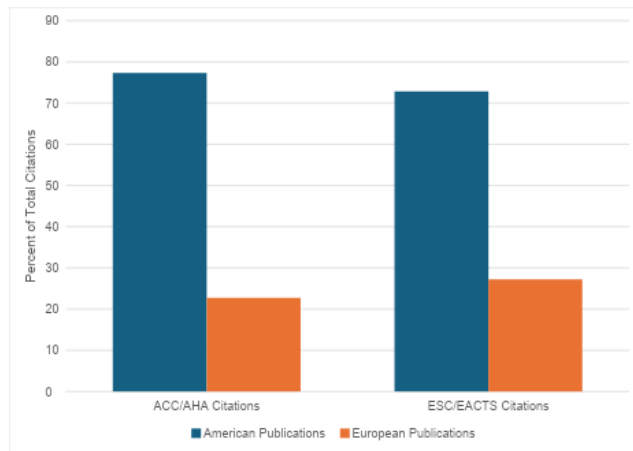

Figure 2. Comparison of origin of sources between ACC/AHA and ESC/EACTS citations.
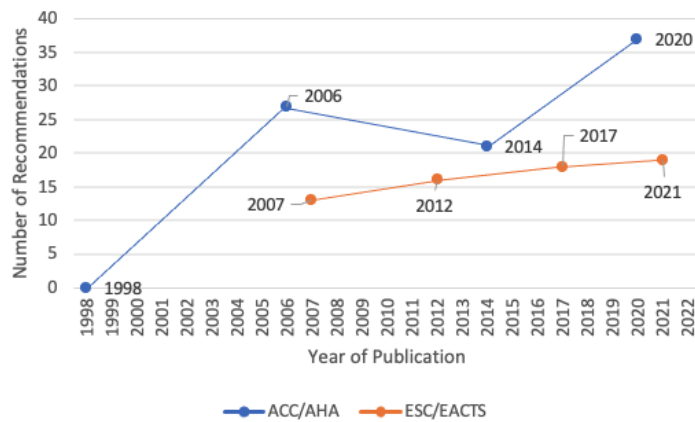

Figure 3. Comparison of Count of AS Exclusive Recommendations published by ACA/AHA vs. ESC/EACTS between 1998-2021.

Stage	Symptomatic?	AVA (cm²)	AVA Index (cm²/m²)	Aortic V_{max} (m/s)	Mean Pressure Gradient (mmHg)	LVEF	Stroke Volume Index (mL/m²)	Details
A	No	N/A	N/A	<2 (m/s)	N/A	N/A	N/A	At risk for AS (BAV, valve sclerosis)
B	No	N/A	N/A	2.0-3.9	<40	>50%	N/A	Progressive AS
C1	No	N/A	N/A	>4	>40	>50%	N/A	Asymptomatic severe AS
C2	No	N/A	N/A	>4	>40	<50%	N/A	Asymptomatic severe AS with LV dysfunction
D1	Yes	N/A	N/A	>4	>40	>50%	N/A	Symptomatic severe high-gradient AS
D2	Yes	<1.0	<0.6	<4	<40	<50%	N/A	Symptomatic, severe low-flow low-gradient with reduced LVEF
D3	Yes	<1.0	<0.6	<4	<40	>50%	<35	Symptomatic severe low-gradient AS with normal LVEF or paradoxical low-flow severe AS

Table 3. ACC/AHA classification for Aortic Stenosis.

Category	AVA (cm²)	AVA Index (cm²/m²)	Aortic V_{max} (m/s)	Mean Pressure Gradient (mmHg)	LVEF	Stroke Volume Index (mL/m²)	Corresponding ACC/AHA Stage
High-gradient	<1	<0.6	>4.0	>40	N/A	N/A	C1 or D1
Low-flow, low-gradient with reduced ejection fraction	<1	<0.6	N/A	<40	<50%	<35	D2 (if symptomatic)
Low-flow, low-gradient with preserved ejection fraction	<1	<0.6	N/A	<40	>50%	<35	D3 (if symptomatic)
Normal-flow, low-gradient with preserved ejection fraction	<1	<0.6	N/A	<40	>50%	>35	None

Table 4. ESC/EACTS General Classifications for Aortic Stenosis.

1) Definition and Classification

The ACC/AHA guidelines classify AS severity into four stages: A-D. This model allows clinicians to precisely categorize AS based on echocardiographic findings and symptoms. Stages A-C are defined by the aortic valve maximum velocity (aortic Vmax), mean pressure gradient, and aortic valve area (AVA). The presence of symptoms related to AS indicates Stage D disease, which is further stratified by the above parameters. Stage D AS is further divided in low-flow/low-gradient AS with or without Left Ventricular Ejection Fraction (LVEF) reduction[1]. These echocardiographic measurements used by ACC/AHA correlate with patient outcomes[3]. Similarly, the ESC/EACTS guidelines also evaluate aortic Vmax, mean pressure gradient and AVA. Based on the same parameters used in the ACC/AHA guidelines (aortic Vmax, mean pressure gradient, and AVA), the ESC/EACTS follow an algorithm in which they initially classify aortic stenosis as severe and pseudo-severe, and then describe four main categories: High-gradient AS, low-flow, low-gradient AS with reduced LVEF, low-flow, low-gradient AS with preserved LVEF, and normal-flow, low-gradient AS with preserved LVEF[2].

2) Diagnostic Evaluation
Initial Diagnostic Evaluation

The recommendations for the initial diagnostic evaluation of aortic stenosis from the ACC/AHA and ESC/EACTS are very similar. Both aim at assessing the transaortic valve velocities, gradients, and stroke volume index (SVi) via echocardiogram to define the severity of AS. As previously mentioned, the ACC/AHA use an A-D staging (See **Table 3**)[1,4], while the ESC/EACTS classify AS into high-gradient AS and low-gradient AS, and low gradient AS is further subdivided based on normal-flow and low-flow with and without LVEF reduction (See **Table 4**)[2]. For low-flow, low-gradient severe AS with normal LVEF, both societies recommend intensive blood pressure control prior to further work-up (ACC/AHA: COR 1, LOE B-NR; No COR or LOE provided by ESC/EACTS)[5,6]. For low-flow, low-gradient AS with reduced LVEF, both societies recommend performing a low-dose dobutamine stress test to define severity, as the presence of inducible symptoms of AS portends a worse prognosis and more urgent need for intervention (ACC/AHA: COR 1, LOE B-NR; ESC/EACTS: COR I, LOE B)[7]. Both societies also recommend the use of coronary CT imaging for calcium score estimation in patients with low-flow, low-gradient AS regardless of LVEF (ACC/AHA: COR 2a, LOE B-NR; ESC/EACTS: COR IIa, LOE C)[8-10]. Differences were also noted in calcium score thresholds for diagnosis of low-flow, low-gradient severe AS when using CT

imaging as a further indicator of severity. ACC/AHA guidelines utilize 1300 in women and 2000 in men as threshold values, while ESC/EACTS guidelines use 1600 for women and 3000 for men[11-18].

Additional Echocardiographic Parameters Used in Assessment of AS

In addition to the basic parameters used for staging described above, the calculation of the ratio of the outflow tract to aortic velocity (also known as Doppler Velocity Index, DVI) is endorsed by both societies[19]. The DVI is an index that is independent of body size, which could predict symptom onset and adverse outcomes even when other parameters are discrepant[20]. The ESC/EACTS also includes additional parameters that could be considered in the assessment of AS, including global longitudinal strain (GLS) to help identify asymptomatic aortic stenosis when GLS is less than 15%, transesophageal echocardiogram when concomitant mitral valve prolapse is present as well as for periprocedural imagining during TAVR or SAVR, exercise testing for risk stratification, and natriuretic peptides[21-25]. However, no COR or LOE are provided for these last recommendations.

In addition, ACC/AHA guidelines state that cardiac catheterization with aortic valvular studies (mean transaortic gradient measurement by simultaneous left ventricular and aortic pressure measurements) may be recommended whenever data from non-invasive testing is inconclusive or in the presence of discrepancy between clinical and echocardiographic findings (ACC/AHA: COR or LOE are provided).

Serial Testing and Follow-up

ACC/AHA guidelines recommend repeating transthoracic echocardiogram (TTE) in all stages of AS (whenever there are new physical exam findings concerning progression or increased hemodynamic demands, either electively (surgery, pregnancy) or acutely (acute medical condition)[26]. However, they do not specify timelines (No COR or LOE provided). ESC/EACTS guidelines recommend a 6-month follow-up with TTE for severe AS. They also advise TTE to assess any possible changes in LVEF, and the use of exercise testing only if symptoms are equivocal (No COR or LOE provided).

3) Medical Therapy

Both societies provide brief recommendations about medical therapy in AS, although only the ACC/AHA guidelines provide a COR and LOE, whereas the ESC/EACTS guidelines do not and instead discuss it in a dedicated text section. The following therapies are discussed by both societies:

Hypertension Management: The ACC/AHA recommends managing hypertension in Stage A, B and C patients (COR 1, LOE B-NR)[27]. The ESC/EACTS recommends hypertension management in general for AS. No specific goals are mentioned.

Statins: Both societies suggest there is no role of statin use for AS progression (ACC/AHA: COR 1, LOE B-NR,)[28]. The ACC/AHA does mention that statins should be used to prevent atherosclerosis in AS populations based on standard risk scores (COR 1, LOE A)[29].

Angiotensin Converting Enzyme Inhibitors: Both societies suggest that ACEI may be beneficial in AS, but in different scenarios. The ACC/AHA suggests its beneficial to reduce mortality in the long-term (COR 2, LOE B-NR)[30,31]. The ESC/EACTS suggest its beneficial before symptom onset and after TAVR vs SAVR [30,32,33].

3) Interventions Such as TAVR, SAVR or Palliative Care

Timing of Intervention for Symptomatic AS

Decision of intervention in severe aortic stenosis is very similar between both societies. Both agree that symptomatic patients with severe high-gradient aortic stenosis (Stage D1 according to ACC/AHA) patients should undergo aortic valve replacement (AVR) (ACC/AHA: COR 1, LOE A; ESC/EACTS: COR I, LOE B)[31,34]. They both also recommend AVR for symptomatic patients with low-flow, low-gradient severe AS alongside reduced LVEF, <50% (ACC/AHA: COR 1, LOE B; ESC/EACTS: COR I, LOE B)[35]. In this last recommendation, ESC/EACTS notes that AVR is recommended if there is evidence of flow reserve (COR I, LOE B) and if no flow reserve, then it is recommended when CCT calcium scoring confirms severe AS (COR: IIa, LOE C). For patients with symptomatic low-flow and low-gradient severe AS with normal LVEF (>50%), both societies recommend AVR only after careful confirmation that symptoms are related to AS (ACC/AHA: COR 1, LOE B-NR; ESC/EACTS: COR IIa, LOE C)[36]. Both societies also agree that AVR should not be performed in symptomatic AS patients with a life expectancy <1 year, or for those whose quality of life is not expected to improve. In those cases, both societies recommend palliative care in lieu of any intervention (ACC/AHA: COR 1, LOE C-EO; ESC/EACTS: COR III, LOE C)[37].

Timing of Intervention for Asymptomatic AS

For asymptomatic patients with AS, the recommendations regarding aortic valve intervention are generally weaker, given a relative lack of evidence. Both societies agree that asymptomatic patients with severe AS and low LVEF (<50%) should undergo AVR (ACC/AHA: COR 1, LOE B; ESC/EACTS:

COR I, LOE B), with the ESC/EACTS noting that it can also be considered in patients with LVEF 50-55%[38-40]. Of note, the ESC/EACTS recommends considering AVR in asymptomatic patients with severe AS and systolic dysfunction (defined as LVEF <55%), with a COR IIa and LOE B. For asymptomatic patients with severe AS in whom symptoms can be demonstrated on exercise testing, both societies recommend intervention (ACC/AHA: COR 2a, LOE B; ESC/EACTS: COR IIa, LOE B). For the aforementioned recommendation, ACC/AHA includes a drop in the systolic blood pressure (SBP) >10mmHg from baseline to peak exercise as a diagnostic criterion, whereas the ESC/EACTS suggests an SBP drop >20mmHg from baseline to exercise (ACC/AHA: COR 2a, LOE B-NR; ESC/EACTS: IIa, LOE C). For asymptomatic patients with severe AS and low procedural risk with normal exercise testing, both societies recommend intervention for the following sub-groups of patients (ACC/AHA: COR 2a, LOE B-NR; ESC/EACTS: COR IIa, LOE B):

1) Patients with markedly elevated B-natriuretic peptide (BNP), defined as an elevation >3x the upper limit of normal when corrected for sex and age, without any other possible explanation (ACC/AHA used an LVEF>50% threshold for this recommendation, whereas ESC/EACTS used an LVEF>55%);

2) Asymptomatic patients with "very severe AS", defined by ESC/EACTS as an aortic maximum velocity of 5 m/s (or also a mean gradient >_ 60 mmHg);

3) Patients with aortic maximum velocity progression >- 0.3 m/s/year (this recommendation requires a high-gradient per ACC/AHA guidelines, and ideally a severe valve calcification by CCT assessment per ESC/EACTS guidelines)[24,38,41-45]. For patients with moderate stenosis undergoing any other cardiac surgery, intervention may be recommended by both societies. ESC/EACTS specifies this recommendation is for only asymptomatic patients, and ACC includes interventions of the ascending aorta in this recommendation (ACC/AHA: COR 2b, LOE C-EO; ESC/EACTS: COR IIa, LOE C).

4) Lastly, ACC/AHA recommends intervention for asymptomatic patients with severe AS with at least 3 serial imaging studies demonstrating LVEF<60% (ACC/AHA: COR 2b, LOE B-NR).

Mode/Choice of Intervention

Both societies recommend that transaortic valve intervention (TAVR) and surgical aortic valve replacement (SAVR) procedures for aortic stenosis

intervention should be performed at a center with a "Heart Team/Heart Valve Team" and the choice of procedure should be based on a shared-patient decision with explanation of risks and benefits. Both societies recommend utilizing a risk assessment strategy (ACC/AHA: STS Score; ESC/EACTS: STS Score and EuroSCORE). When it comes to choosing between TAVR vs SAVR, both societies have significant differences.

The ACC/AHA evaluates the feasibility of administering vitamin K antagonists (VKA) when recommending TAVR vs SAVR, and recommends that if feasible, age should also be considered. If patients are candidates for AVR and <50 years old, SAVR with mechanical AVR is recommended (COR 2a, LOE B-R). In patients between 50-65 years of age, SAVR can be done with either a mechanical or bioprosthetic valve, based on patient preference and patient ability to comply with anticoagulation (COR 2a, LOE B-R). For patients <65 years old without symptomatic severe AS (D1, D2, D3) or without asymptomatic severe AS with LVEF <50%, unsuitable valve/vascular anatomy, then SAVR becomes a COR 1, LOE A indication. For patients >80 years old with the previously mentioned criteria, the transfemoral TAVR becomes preferential (COR 1, LOE A). For patients >65 years old, bioprosthetic AVR is recommended over a mechanical AVR (COR 2a, LOE B-R). Lastly, in patients <50 years old who prefer a bioprosthetic valve instead of a mechanical valve, a pulmonic autograft replacement (Ross procedure) may be considered (COR 2b, LOE B-NR).

The ESC/EACTS recommends SAVR in younger patients with lower risk of surgery, defined as <75 years old and STS-PROM/EUROScore II<4%), or in those who are not candidates for TAVR (COR I, LOE B). For those >75 years old, or with an elevated STS-PROM/EUROScore >8%, or those unsuitable for SAVR, TAVR is recommended (COR I, LOE A). The guidelines also recommend assessing individual clinical, anatomical, and procedural characteristics for the patients not meeting the previous criteria prior to deciding whether they are TAVR vs SAVR candidates (COR I, LOE B). For patients who are not deemed suitable for transfemoral TAVR, a non-transfemoral approach may be considered (COR IIb, LOE C). For those patients with severe AS who either require urgent non-cardiac surgery or present with hemodynamically instability, balloon aortic valvotomy may be considered (COR IIb, LOE C).

The differing age cutoffs between the ACC/AHA and ESC/EACTS guidelines reflect regional variations in clinical practice and healthcare priorities. The

ACC/AHA recommends SAVR for patients under 65 years, prioritizing long-term valve durability, while ESC/EACTS recommends SAVR for those under 75 years, potentially to reduce surgical risks in older patients. In the U.S., younger patients may undergo SAVR more frequently, which might be linked to concerns about the longevity of TAVR valves in more active individuals. In Europe, the broader application of TAVR for patients aged 65 to 75 could lead to different outcomes, especially concerning valve durability and procedural risks. These variations may influence regional healthcare strategies and patient management.

TAVR Diagnostic Workup
Both societies guidelines recommend using cardiac computed tomography (CCT) prior to TAVR. ACC/AHA guidelines recommend CCT for procedural planning, including the measurement of the annulus area, leaflet length, and annular-to-coronary ostial distance. (14-18). ESC/EACTS guidelines recommend CTT for the assessment of aortic valve anatomy, annular size and shape, vascular and valve calcification, risk of coronary ostial obstruction, aortic root dimension assessment, optimal fluoroscopic projections for valve deployment, and assessment of vascular access preference.

4) Special Patient Population
ACC/AHA does not provide specific recommendations relevant to special populations. ESC/EACTS guidelines suggest higher mortality in women than men with severe AS and recommend equal access to care[46-48]. In the presence of both concomitant CAD and AS, the guidelines recommend the consideration of revascularization in conjunction with aortic valve intervention. Patients aged <70 years old with mean gradient progression of >5mmHg per year benefit from SAVR, only when getting concomitant CABG[49]. Whenever baseline peak gradient increases above 30mmHg, the use of PCI during TAVR should be analyzed based on the clinical scenario, pattern of CAD, and percentage of myocardium at risk (No COR or LOE provided)[50].

5) Potential Citation Bias
The high percentage of American publications cited by both ACC/AHA and ESC/EACTS guidelines (77.29% and 72.8%, respectively) suggests a potential bias towards American research. This raises concerns about the underrepresentation of studies from Europe and other regions, which could impact the global applicability of these guidelines.

Conclusion
Both the ACC/AHA and ESC/EACTS provide comprehensive guidelines with several similarities in

the management of aortic stenosis. Each set of guidelines offers a detailed framework for clinicians to approach, diagnose, classify, and treat aortic stenosis. However, there are notable differences in the number of recommendations and the grading systems used for COR and LOE. Additionally, the definitions of aortic stenosis and the recommendations for management, both medical and surgical, differ slightly, particularly regarding the intervention of choice based on age. Despite these differences, the guidelines complement each other, with shared evidence supporting the recommendations in both sets. It is crucial for clinicians to adhere to guidelines from their region of practice to ensure standardized care in the management of aortic stenosis while acknowledging the validity of different practices and recommendations from counterpart professional societies.

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CASE REPORT

A Chronic Traumatic Orbital Foreign Body and Actinomycetoma

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ABSTRACT

Introduction: Traumatic ocular foreign bodies are often the result of hazardous manual labor. However, foreign bodies should remain on the differential for chronic or recurrent orbital infections. We present the first reported case of a periorbital actinomycetoma associated with a non-iatrogenic, chronic foreign body in an inter-partner violence patient-survivor.

Patient Presentation: A 28-year-old female with history of amblyopia and inter-partner violence-related facial trauma 6 months prior, presented with a 6-month history of recurrent right eye infections, complicated by progressively worsening symptoms over the previous 2 days. Gross exam revealed a hypoglobus right eye. Right and left eye visual acuity were 20/200 and 20/20, respectively. On slit lamp exam, right eyelids showed purulent discharge, lid edema, and erythema. A pocket oozing pus from a central opening was seen at the superonasal quadrant of the right cul-de-sac. Computed tomography detected a geometrically-symmetric enhancement anteromedially to the right globe, consistent with abscess. Magnetic resonance imaging of this same lesion was consistent with an "air bubble". Diagnosis of pre-septal abscess with air was made. A plastic bead was found superomedial to the right globe intraoperatively. Biopsied tissue was identified as a granuloma. Additional pathology examination showed sulfur granules and stains were consistent with an actinomycetoma.

Discussion: Ophthalmic involvement occurs in almost half of inter-partner violence related traumas. Orbital floor fractures and lid contusions are common findings. When overt ophthalmic trauma is not present, a thorough ophthalmic exam should still be performed. Resulting complications may present as chronic or recurring events and seem unrelated to the inciting violence.

Keywords: Actinomycetoma, Foreign Body Response, Inter-Partner Violence

Introduction

Non-iatrogenic ocular foreign bodies (FB) refer to objects that enter the eye accidentally and may cause irritation or secondary infection. Although rare, ocular FBs can result from inter-partner violence (IPV). An estimated 45% of IPV-related injuries involve the orbit[1]. Of these, less than 2% involve a foreign body[2]. IPV survivors may experience shame or fear repercussions from their abuser, resulting in delayed presentation. We present a novel case of a periorbital actinomycetoma associated with a non-iatrogenic, chronic orbital FB, presumably from IPV, masquerading as a pre-septal abscess radiologically[3].

Patient Presentation

A 28-year-old female presented to an urgent care clinic for 6 months of recurrent "infections" in her right eye (OD), characterized by orbital pain and purulent discharge. Symptoms were accompanied by 2 days of decreased vision OD at presentation. The left eye (OS) was asymptomatic. Past medical history was significant for IPV-related jaw trauma 6 months ago. Past ocular history included amblyopia OD with self-reported "poor" but stable baseline visual acuity OD. She was not taking medications and had a penicillin allergy.

The patient was started on empiric intravenous (IV) vancomycin for a suspected orbital infection OD at an outside hospital. With no clinical improvement after 24 hours, the patient was transferred to Houston Methodist Hospital (HMH). Ophthalmic exam revealed 1-2 millimeters (mm) of hypoglobus OD. The visual acuity was 20/200 OD and 20/20 OS. Intraocular pressure was normal in both eyes (OU). Pupils were equal, round, and demonstrated no relative afferent pupillary defect. Extraocular movements were intact OU. Confrontational visual field was globally restricted OD and full OS. Slit lamp examination showed purulent discharge, lid edema, and erythema OD. A pocket oozing pus from a central opening was seen at the superonasal quadrant of the right cul-de-sac. Conjunctiva and sclera examination OD showed 4+ injection with chemosis. Dilated fundus examinations OU were normal.

Computed tomography (CT) scan of the orbit with contrast was consistent with a 4-mm superomedial "abscess" containing an "air bubble" and periorbital cellulitis with subtle retrobulbar extension of infection of the right orbit (**Figure 1A**). Magnetic resonance imaging (MRI) of the orbit and brain with and without contrast showed enhancement anterior to the right globe with a well-defined focal signal loss medially, consistent with a presumed "air bubble" (**Figure 1B**). During surgical exploration of the presumed abscess, a 5-mm^3 yellow-orange, plastic bead was noted in the superomedial portion of the right orbit (**Figure 1C, 1D**). A brownish, rubbery mass was also excised (**Figure 1C**). Histopathology confirmed a foreign body response (FBR) and gram stain highlighted the gram-positive, filamentous organisms within the granules (**Figure 1E & 1F**). She was treated with IV levofloxacin and topical erythromycin ointment. Oral trimethoprim-sulfamethoxazole and levofloxacin with topical dexamethasone-neomycin-polymyxin 0.1% ophthalmic solution were prescribed at discharge. The patient denied prior foreign body exposure. Given the patient's history of domestic abuse, social work was consulted.

Discussion

Chronic, traumatic ophthalmic FBs are unusual as most are metallic or organic. However, clinicians should be aware an occult FB can occur despite the absence of trauma. Over time, entry wounds may heal, and the patient may not recall details of the initial FB exposure. A chronic FBR can mimic orbital inflammatory disease, just as the initial FB reaction mimics infectious orbital cellulitis or abscess[4,5]. The FBR produced a ring-enhancing lesion with surrounding purulence on CT and a hypointense lesion suggesting an "air bubble" on MRI. The surrounding inflammatory reaction led to an initial misdiagnosis of orbital cellulitis with intralesional air. In retrospect, the geometrically-symmetrical round lesion on imaging was consistent with a plastic FB (**Table 1**)[6]. In such cases, biopsy and histopathology may be necessary to confirm the diagnosis.

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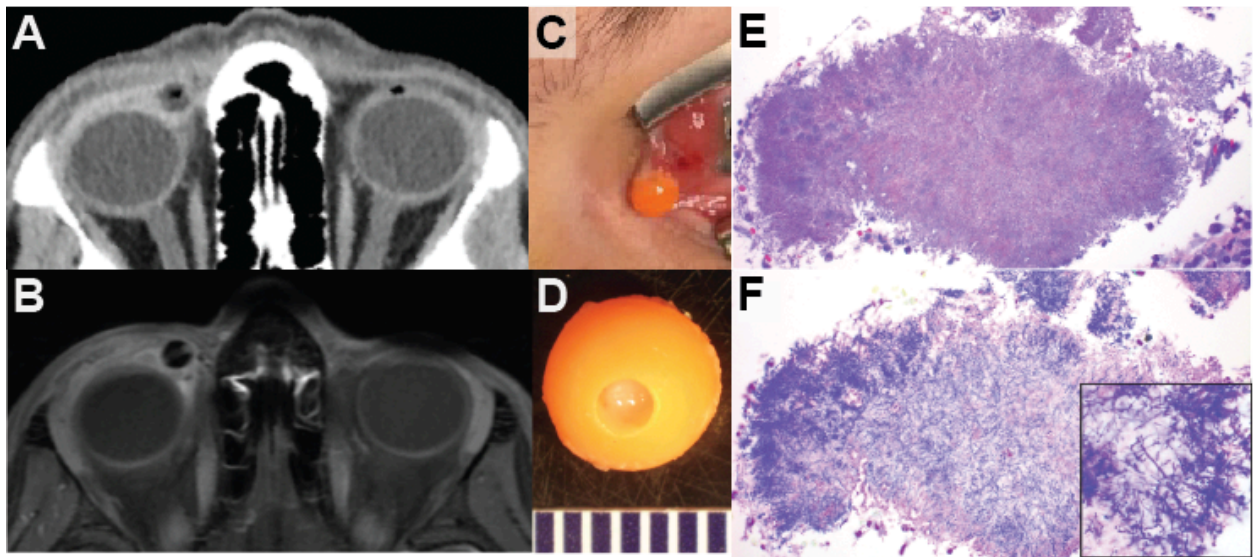
Figure 1. A) Axial CT Orbit W Contrast with a space occupying lesion superomedially to right globe, initially interpreted as abscess. **B)** Axial MRI Brain/Orbit W Wo Contrast with hyperintense outline superomedial to right globe with inner signal loss, initially interpreted as air bubble. **C)** Gross image of the conjunctival lesion with yellow-orange plastic bead found lodged superomedially to right globe. **D)** Gross photograph of plastic bead after removal measuring 6 mm in greatest dimension. **E)** High-power view of sulfur granule (H&E-stained section). **F)** High-power view of sulfur granules stained with Gram. Many gram-positive, filamentous organisms are seen (Inset: 100X oil-immersion view).

Table 1. Imaging Characteristics of FB and Related Inflammatory Responses

Imaging Modality	**FBR or Inflammatory Process**							
	Plastic	**Glass**	**Stone**	**Metal**	**Wood**	**Trapped Air**	**FBR**	**Acute Inflammation**
Radiograph	Radiolucent	Radiopaque	Radiopaque	Radiopaque	Radiolucent	Radiolucent	Poor modality for evaluation	Poor modality for evaluation
Ultrasound	Hyperechoic with posterior reverberation	Hyperechoic with posterior reverberation	Hyperechoic with posterior acoustic shadow	Hyperechoic with posterior reverberation	Hyperechoic with posterior acoustic shadow, reverberation related to gas content	Hyperechoic with posterior acoustic shadow	Hypoechoic halo surrounding FB	Hypoechoic halo surrounding FB
CT	10-20 HU +/- Hyperattenuation	500-1900 HU	>1500 HU	>3000 HU*	50-80 HU +/- Hyperattenuation	-1000 HU	Unable to evaluate degree of inflammation	Unable to evaluate degree of inflammation
MRI	Low signal intensity at T1WI and T2WI	Low signal intensity at T1WI and T2WI	Low signal intensity at T1WI and T2WI	Magnetic susceptibility artifact	Low signal intensity at T1WI and T2WI	No signal	Low signal intensity at T1WI and T2WI with linear enhancement surrounding FB	Halo of low signal intensity at T1WI, marked peripheral enhancement around FB post-contrast

FB = Foreign Body, FBR = Foreign Body Response, HU = Hounsfield Units

*= Except aluminum

Table 1. Summary of foreign body and inflammatory response characteristics on imaging.

How Operating on Mice Taught Me About Empathy

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As I was prompted into the surgery room to observe the procedure of harvesting organs, I took a deep breath, stepped into the room, and felt an instant chill. I quietly maneuvered around the others, seating myself as far away from everyone as possible, to ensure I had the best view of the procedure but could still remain out of the way. The bright fluorescents pained my eyes and despite the coolness of the room, sweat began pooling in the center of my palms and I thoughtlessly wiped them on the sides of my pants. The head surgeon collected his tools from the autoclave and arranged them beside the operating table. He swiftly opened up a cage, extracted a mouse, number 115R, whose little paws ran frantically through the air, hopelessly trying to escape his fate, and placed him into the sleeping chamber.

My mind flashed to one of my favorite childhood books, *Stuart Little*, and I couldn't help but wonder about the mouse's family. How many siblings did he have? What did it feel like, not having ever seen outside of the laboratory? Never experiencing the warmth of the sun, never feeling the breeze flutter against his whiskers? Never once seeing the vibrant green, lush leaves of the trees? I was quickly drawn back to the present as the surgeon asked if I was ready to observe. I nodded slowly, as the surgeon reached for the scalpel and made the first cut.

As the mouse's neck snapped, sacrificing his life for the greater good of medical research, though he would never know it, tears began pooling in the corners of my eyes. I quickly wiped them away with the cuffs of my sleeves and promptly continued watching as the surgeon slowly took apart the mouse, organ by organ. I flinched but kept my eyes glued to the mouse. Deep, crimson blood oozed out as the heart, bladder, kidney, intestines, brain, and tail were all extracted from the mouse's limp body, placed into small numbered tubes, and thrown carelessly into the liquid nitrogen, to be frozen up for later observation. The smell, so putrid and rancid, had me gagging in my seat, and the thought of having any appetite left my mind for days. And just like that, the procedure was over just as quickly as it began and the surgeon had switched gears to cleaning the operating table. He moved rapidly as this procedure was to be done to not just one, but several cages of mice that were all lined up against the wall, watching their fellow mouse friend meet his impending doom. Though I was just observing, I felt a wave of guilt wash over me, imagining how terrified the mice must feel as they witnessed their inevitable fates. I found that I was constantly reminding myself of the importance of this process. Cruel, yes, but potentially leading to saving the lives of many. I thought of the families in distress, the mothers and fathers, the sons and daughters, the brothers and sisters, the friends and peers, who may have been undergoing the stress of watching their loved ones suffer from heart problems that there was yet to be a cure of. This was what I repeated in my head over and over again when eventually, I was the one with the scalpel in hand, extracting the organs from mouse number 116R's decaying body.

Small strands of dusty gray fur lightly fluttered in the air as the incision in the mouse's belly deepened. The two front teeth peaked at me through his little mouth as he lay on his back, bare, helpless, and alone. Each cut into the mouse felt like a fresh wound in my own heart. I used the push pin needles to pin the mouse down at his paws as I opened him up on the table. It was nauseatingly difficult, and I couldn't help but feel disgusted. Not at the mouse's exposed body, but at myself. How could I do this? Was this the true cost of saving *human* lives? His name, 116R, was just another number to cross off the growing list of mice in the facility that needed to be operated on. Despite it all, I persisted through the operation, desperate to learn all that I could. Days turned into weeks, and I gradually became more accustomed to my daily routine of

working with the mice's stiff bodies. I put my lab coat on with a sense of importance as I made my way to the surgery room in pursuit of doing what I had to do. I began feeling more and more dissociated as my surgical tools worked their way into the mouse's body and I extracted and preserved what needed to be and placed the remainder of the body aside. After all, they were no longer alive to feel any pain, so what was the harm in harvesting their organs to advance the studies? Day in and day out, I was simply there to do my job. Yet somewhere in the back of my mind, the guilt gnawed at my conscience, begging me to stop and feel the sadness for another life that was lost. I slowly became disheartened with each day I had to step into the lab and perform these tasks, mourning the countless mice who had sacrificed themselves to save others. They were silent martyrs that no one came to appreciate once the treatments were developed and the cures were found. Their deathbeds were drawn out for them long before they were born, and yet, no one was at their funeral to consider the lives they could have lived. *The lives that they lost*. This cause that seemed so worthwhile and incredibly laudable in the long run, had an achingly dark and disturbingly brutal means of getting there. These mice were dying at the expense of saving human lives, but what right did we have to cause the mice to suffer? They were bred solely for the purpose of seeing the inside of the lab until their death, but as living creatures, didn't they deserve more? Freedom, justice, and equality… all very much 'humanitarian values' that we proudly uphold, yet there's no animal equivalent word for such a meaningful and deep-rooted phrase.

It is well understood and agreed upon that basic human rights are fundamental for bettering the human condition. But how do these rights extend onto other living beings?Who is standing up for these mice, who get tested on each and every day to provide humans with their fundamental right to health? As I juggled these thoughts in my mind, I questioned my ability to empathize with others. More specifically, I questioned the means by which I was prioritizing empathy. The empathy I was feeling towards the mice conflicted with the empathy I was feeling towards humans. Was a mouse more important than a human? Was a human more important than a mouse? The questions may seem silly, but to me, this debate was a constant battle occurring in my mind, and it led me to wonder if there was any way to empathize with both. Recently, I read the article, "Learning Empathy From The Dead " by John Tyler Allen[1], which struck a nerve with me as it reminded me all too well of the feelings I experienced with the mice. The author elucidated the discomfort of medical students in anatomy labs as they dissected the human cadavers and how that can trigger various

emotional responses based on their personal experiences. Allen highlights that to bridge the gap between the medical students' tasks and their emotional experiences, the Oklahoma University College of Medicine's former dean executive and current professor and researcher, Jerry Vannatta, initiated a Donor Luncheon at the school in hopes to "equip the students to better cope with the dissection, which can be a traumatic experience." Though in the past, it became the norm to emotionally detach from the cadavers in the anatomy labs, this new approach allows students to learn about the lives that were lived before they became lifelong donors to improve medical knowledge. Learning about the people not only "changed the whole atmosphere of the Gross Anatomy experience," at that medical school according to Vannatta, but it also pushed the medical students to empathize with the people and slightly lessened the discomforts of the moments.Though I have yet to dissect a human cadaver, the maudlin emotions I feel from dissecting mice has taught me more about empathy than suppressing my emotions does, which is why this approach is a strong one. The hopelessness I feel when the mice are cut open and taken apart and the sadness I feel when I realize they will never come back, has not only led me to challenge the idea of what empathy truly means in the medical world, but has also made me think hard about what the motivations of doing this type of research is in the first place, especially considering that I have no means of connecting with the mice in the same way that the medical students can with their human cadavers.

One summer, I volunteered at a clinic, where one patient interaction stood out to me amidst my time there. I was sitting behind the front desk, monotonously reminding patients of their follow-up appointments, when a man of around 70 years of age stepped into the clinic. The skin on his face was drooped, worn with time and exhaustion, his nails were clipped to the rim, and his calloused hands were weathered from hard work. His balance was unsteady as he limped to the front desk to check-in for his appointment. He had a pained look on his expression as he walked with difficulty towards his room. Within a couple minutes, I was informed that he would be receiving an injection in his knee to alleviate his pain. The medication syringe was already prepared by the patient's tableside when I entered the room, and he eyed it warily as the doctor put her gloves on and moved toward the syringe. The patient shifted his attention to me as his forehead creased with frustration when the needle made contact with his knee. "Do you want to become a doctor when you grow up too, young lady?" I nodded, and was stunned by his following claims. His voice was unfaltering when he said "Doctors cause you nothing

but pain and care nothing about you. At the end of the day, they make you wait in your room for hours until they visit you, spend five minutes with you to tell you you're ill, and leave with their pockets stuffed and their duties fulfilled."

Every day after this encounter left me bewildered and in a perpetual state of deep reflection. I could not even begin to fathom how the healthcare system failed this man. I began to puzzle about whether I had chosen the appropriate field for expressing empathy or if I would become as desensitized as others. My doubts in the healthcare profession deepened and I wondered, how many more patients felt the same way? Were doctors becoming less and less empathetic towards their patients because they were trained to stop feeling? I mulled over this question repeatedly in my mind, as the realities of what the patient said washed over me like a huge tidal wave.

To this day I am still trying to comprehend which side I feel more guilt for empathizing with: the mice or the humans. The mice were spared any empathy by researchers as they were sacrificed for the sake of medical research in hopes of saving human lives, while the humans were excused from receiving empathy from their doctors as they were diagnosed with chronic illnesses or cut open when they became cadavers. While I desperately wish that there was an alternate solution to this dilemma to prevent the harming of these animals and still effectively find cures for people's illnesses, I have slowly come to terms with the unfortunate reality that this is the closest we can get to helping people who need it most.

As I reflect on my aforementioned experiences, I tend to find myself pondering on what lesson I was meant to learn from it all. Was I wrong for feeling guilty for performing surgeries on mice when I was participating in medical research that was taking large steps in saving lives? Was I wrong for questioning medical ethics when the old man shared his thoughts on doctors' lack of empathy when caring for patients? Or was the true lesson of it all to understand that empathy doesn't necessarily mean choosing one side or the other, rather feeling for both and understanding that the future of medicine relies on being able to put ourselves in others' shoes rather than being disconnected from the emotions behind the harsh realities of the world.

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"The needle slid through my belly and navigated deeper to you," my mother narrated. We sat comfortably in wicker chairs as old as her.

"You began moving," her eyes stared at the clear blue skies that were as vivid as her memories of the amniocentesis procedure she had undergone during her second trimester.

"The technician looked up at me. Your baby is sensing your anxiety. Calm down, he cautioned. I took a deep breath and gently patted my belly, the barrier between you and me. And then, as if you had sensed my calmness, you stopped your silly petty act and lay quiet as a mouse," my mother smiled. We broke into a loud laugh that sounded like the cacophony of seagulls. Unintentionally, we had briefly muted the chittering of the evening songbirds.

The amniocentesis results were not what my parents had expected. They were told that I was in the high-risk percentile of being born with Down syndrome. For the next six months, the thought had worried them.

"Down baby or not, we wanted you, and when finally the doctor placed you in my arms," she held back her tears, "we were grateful." She clasped her hands.

The next morning, I started my volunteer shift at a Down syndrome center. I wanted to support a community, and I chose the center partly because I felt if not for that fraction of a percentile, I would have been a participant at the center for Down syndrome.

Upon arrival, Amanda, a 27-year-old woman, greeted me. She told me she was a regular attendee of the three-hour volunteer program scheduled each week. Amanda guided me through the specifics of the program that covered activities such as socializing, drawing, exercising and preparing meals, each spaced out through a three-hour time slot.

"This is Sudhi, our new volunteer," the coordinator announced when the program participants gathered in the hallway.

"Sudhi," the adult participants repeated my name, waving and cheering. The participants kick-started the day by answering warm-up questions from a worksheet. What day was it? What time does the clock read? How hot does an oven get? Were they hurt that their skills weren't at the "normal" level? Were they worried they wouldn't improve? Did it make them feel bad to see me, someone ten, twenty, and even fifty years younger than them, try to teach them basics? Their collective cheers drew me away from my spiraling thoughts. The young man in front of me, Elijah, raised his fist in the air for a fist bump and waited for me to return the gesture.

"I got it right!" He said, patting his shoulder.

I clapped as the coordinator asked the next question. Each candidate beamed with pride and congratulated one another whenever they answered a question right. An hour of both learning and laughter passed by before it was time for exercise. After everyone had gathered their water bottles and tied their shoelaces, we walked to the gym with rows of elliptical machines and exercise bikes. Elijah, the clever young man who I'd fist-bumped in the classroom, reached for a basketball. Amanda picked up a five-pound dumbbell. I walked around, making small talk. When I reached her, I noticed her grunt softly each time she curled it. She asked that I pick up a weight and join her. She noticed me stare at my fist as I curled my arm and released.

"Heavy isn't it?" I smiled, learning from my coordinator that it helped to empathize and relate. Serena nodded. Did she recognize I was different? Probably stronger?

She completed a few more reps before holding her head up and telling me, "You know, my momma says I'm strong, just like my father. He's a weightlifter." Her eyes beamed with confidence.

For the next few hours, we spent time making jewelry and eating lunch, but I caught myself jumping in to help every time someone struggled to thread a bead or open their packaged snack. But while I helped, I got to know more about each person. I asked them about when they had first joined the program, who they were friends with, and what their favorite part of the program was. They wanted to know more about me too, and so I answered their questions about how old I was and what I did in college. I felt assured that I wasn't being judged about the questions I asked, the compliments I gave, and the stories I narrated. No, there was no room for any disheartenment or commiseration.

I had received the chance to observe and aid the volunteer coordinator during casual conversations and from her entertaining yet structured lessons. She knew exactly when to intervene and help. I didn't always have to rush when someone struggled to open their water bottle or when they were stuck on a math problem. I realized I wasn't losing compassion or my ability to offer empathy if I waited a bit more for them to figure it out on their own. All went well until the day drew to an end with a fun dance. The idea of dancing made me feel anxious. This was just a dance, I had to remind myself. I wasn't being judged. Amanda approached me, smiled, then freely waved her hands in the air. Alongside her, I busted out moves from my third-grade cha-cha dance. Everyone was jumping up and down while Amanda and I synced with them. We smiled at each other as the beat faded and the last note struck a soft tone.

"We can dance again next week," Amanda nodded eagerly as we gathered near the entrance for pickup time. It felt rewarding knowing that I had taken the first step to volunteer to help a special group of people. But next time, I wanted to offer help in ways that they most needed.

As an aspiring physician, it was natural to jump in and offer aid and show empathy at any moment possible. In the early phase of learning how to care for patients and understand their needs, my attention towards their disparities and differences grew stronger. This led to overthinking my own actions and undermining their abilities. A double-edged sword, it became clearer to me that just like all things good, empathy is most beneficial while balanced with logic and initiative. Slightly adjusting my mindset, I returned to the center the following week. There were different activity stations, an ice-cream-making table, crafting area, and a puzzle section. I started off at the ice-cream table, where volunteers assisted the participants in wearing an apron, adding ingredients, and mixing them in a bag. I waited and observed to see who could choose their apron and wear it, who needed help in choosing an apron but not wearing it, and who needed help through the entire process. By the time the ice creams were ready, I gained a better understanding of the group's dexterity, decision-making ability, and personal choices. I knew Elijah had no trouble wearing an apron, but needed guidance in choosing an apron color. Victoria's actions showcased her ability to pick out a purple apron quickly, but required help with measuring out ingredients. I realized Tim could use a little aid the whole time until his ice cream was ready to eat.

When the participants were enjoying their frozen treats, I spoke to Elijah's mother, who was volunteering her time at the crafting station. She asked me about her son's performance, joking about his troublemaking nature. She told me that finding an accepting space for her son had been difficult before discovering the center. It felt like she and her son were the only ones in the battle against Down syndrome and all its stigmas living within and outside the healthcare system. I couldn't help but think of my mother and how our lives would have been, but I didn't let the thought weigh me down, rather channeling my empathy into action. I solved puzzles with Elijah so his mother could spend time with other parents.

That evening, my mother and I sat in our backyard wicker chairs as usual while she told me another story, this one about a blind school she had volunteered at during her college years. Overwhelmed, she broke down into tears at the sight of blind children. The coordinator guided her into the hallway and told her that the children would benefit most from an empathetic yet contented volunteer.

"Empathy is important, but not at the expense of your ability to fulfill your purpose."

"Is there anything as too much empathy?" I asked.

"I believe so, and it's not a bad thing at all. But I will tell you it can be overwhelming and will take away your best motives from your interactions."

Processing her words, I reflected on the day. The patients and their parents faced countless challenges, but they took on each hurdle with a smile on their face. I wondered how. They didn't look at society through a stratified lens but uplifted each other despite differences. It wasn't a lack of awareness that kept them cheerful and smiling; it was their acceptance of variances and, thus, their awareness of self. Victoria knew she could handle the weights on her own, and Elijah took charge in activities he was aware he could excel in.

With my own newfound awareness of my ability to empathize, I took on shifts with an attitude to use compassion in initiatives that helped others not in ways I wanted to but in ways they needed it.

Balancing Our Way: Navigating Empathy and Independence in Healthcare
In reply to Guiding Their Way

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Laughter echoes off the pastel walls of a kindergarten classroom. One child is trying to stack colorful ABC blocks. It's his first time stacking the blocks, so they keep falling over. You can help him by stacking the blocks for him, but he still won't know how to do it himself. Next time, his pyramid will collapse. You could also just let him figure it out on his own, but that just leaves him to struggle. Sudhi in *Guiding Their Way* faces a similar dilemma. She finds herself helping her mentees at every moment but learns that it is even more helpful to sometimes let them figure things out on their own. Empathy drives us to jump in and help others, but this can sometimes take a condescending approach that leaves little room for growth. However, refusing to firmly intervene for the sake of autonomy can leave patients to suffer alone. It is crucial for providers to find a balance between empathy and independence for the sake of their patients' wellbeing.

Empathy holds benefits for the treatment of patients but can interfere with the true needs of a patient. Although it varies by culture, empathy typically pertains to understanding others' feelings, and relates to kindness, compassion, and patient-centeredness.[1] In healthcare settings, empathy often drives providers to respond appropriately to suffering to appropriately help patients. By applying empathy in their work, nurses and physicians improve the experience for patients through higher satisfaction and lower distress.[2] Empathy ensures we are in-tune with how patients feel, allowing us to adapt our response to best fit their current emotional needs.

However, it is important to not become so fixated on empathy to the detriment of the patient. At first glance, this may sound strange to suggest, but Sudhi clearly faces this dilemma. In one study, dementia patients who were constantly supervised and assisted suffered more falls and injuries than those given some time to struggle on their own.[3] In other words, excessive help at every moment left patients more reliant on assistance. It is our nature, even our calling, to jump in when someone needs help, but sometimes our help may develop overreliance. One could technically help a patient in physical therapy by lifting the weights for them, but it is through letting the patient struggle that they grow stronger. In this way, excessive empathy can often get in the way of patient improvement and leave patients with little independence.

Independence is valuable for allowing the patient to grow through overcoming feasible challenges, but burdening patients too much can let their healing progress derail. The most frequently discussed benefit of independence is that it respects patient autonomy.[1] However, this completely ignores the clinical benefits of patient independence. For example, Sudhi wants to jump in right away to help with opening a water bottle or solve a math problem. However, only by letting the participants solve problems on their own does Sudhi learn what each person needs. Only then did Sudhi know how to best help each participant whether it was tying an apron or offering an explanation. If someone helps the patient with every single thing, they never learn what the patient actually needs. Though it can feel unempathetic to let patients struggle, it gives them the chance to grow and offers them some autonomy over when they receive help.

Nevertheless, patients are at the clinic or hospital to seek help, so it is irresponsible to throw the burden back onto them in the name of independence. Furthermore, providers must be careful since independence today does not mean they won't need assistance tomorrow. For example, some dementia patients struggle with tasks they once could complete on their own.[4,5] However, the same may be true in that they become capable of tasks previously impossible for them.. Just as blood pressure or A1C levels change over time and necessitate a change in treatment, it is

important for physicians to adapt just like Sudhi to the transient needs of the individual.[6] Consequently, providers need to balance empathy and independence in their care for others, adapting to the unique needs of each individual.

It can be compelling to give empathetic assistance to one's patients, but this can become patronizing and even counterproductive. It is also tempting, in the spirit of patient autonomy, to give the patient great independence in their care. However, it is most important to balance both empathy and independence. Many of us, including Sudhi, are still learning how best to adapt our approach to give room for patients to grow on their own while jumping in to help as needed. Whether it is deciding when to offer an explanation for tying an apron or how to teach a child to stack their bocks, it is our moral imperative to adapt our care in order to manage both beneficence and autonomy.

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Supplemental Issue
Spring 2025

ABSTRACT

Advance Care Planning in a Multidisciplinary Amyotrophic Lateral Sclerosis Clinic

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Introduction

Patients with amyotrophic lateral sclerosis (ALS) have unique care needs that lead to conversations about percutaneous gastrostomy and tracheostomy relatively early in the disease trajectory. Advance care planning (ACP) provides an organized, systematic method of effectively communicating and documenting patient goals and preferences, but documentation of ACP in the ALS population is consistently relatively low, around 30%. Outpatient palliative care engagement of ALS patients has been shown to substantially increase rates of ACP completion. We sought to evaluate the effectiveness of integrated palliative care and social work to increase rates of ACP documentation in a multidisciplinary, urban, ALS clinic.

Methods

In May 2023, a palliative care physician and social worker were added as standard parts of the multidisciplinary team at the Baylor College of Medicine ALS clinic. This included the addition of routine discussion in the clinic huddle of ACP documentation completion. A retrospective chart review was performed from clinic dates of September 2022 through September 2023 to capture rates of various subsets of ACP documentation, including discussion, completion, and filing rates of advanced directives (AD), out-of-hospital do-not-resuscitate (OOH DNR), and medical power of attorney (MPOA) documents. ACP documentation quality for each visit was scored from a range of 0 to 3 to measure the level of detail in provider notes, with 0 indicating no documentation and 3 indicating a high level of detail.

Results

61 patients were seen, of whom 33% (20/61) saw either a palliative care physician or social worker, of which 100% (20/20) had documented ACP discussions with a documentation quality score of 3. Patients who saw either a palliative care physician or social worker saw higher discussion rates compared to patients who saw a neurologist alone (41/61) across all subsets of ACP, including in AD (90% vs. 63%), OOH DNR (30% vs. 7%), and MPOA (90% vs. 59%) documentation. ACP discussion documentation rate in patients who saw a neurologist alone increased from 55% (11/20) to 81% (17/21) following the addition of the palliative care physician and social worker to the multidisciplinary team.

Conclusion

Integration of a palliative care physician and social worker to the ALS care team increased rates of detailed ACP discussion across all subsets. While all patients who met with palliative care and social work received detailed ACP discussion, the increase in rates of ACP discussion in patients who saw neurologists alone suggests that the introduction of team members who focus more on effective ACP discussion and documentation may have an influence on the rest of the multidisciplinary care team.

Advance Care Planning in a Multidisciplinary Amyotrophic Lateral Sclerosis Clinic

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Introduction

50% of patients with amyotrophic lateral sclerosis (ALS) die within 36 months after symptom onset, emphasizing the need to prevent delays in discussing patient values, life goals, and preferences.

Advanced care planning (ACP) provides an organized, systematic method of effectively documenting patient goals and preferences, but documentation of ACP in the ALS population is consistently relatively low, around 30%.

The objective of this quality improvement study aim is to evaluate the effectiveness of integrated palliative care and social work to increase rates of ACP documentation in a multidisciplinary, urban, ALS clinic.

Methods

In May 2023, a **palliative care physician and social worker** were added to the multidisciplinary team at the Baylor College of Medicine ALS clinic. This included the addition of routine discussion in the clinic huddle of **ACP documentation completion**.

A **retrospective chart review** was performed from clinic dates of September 2022 through September 2023 to capture rates of ACP documentation.

Variables included **discussion, completion, and filing rates** of advanced directives (AD), out-of-hospital do-not-resuscitate (OOH DNR), and medical power of attorney (MPOA) documents.

ACP documentation quality for each visit was scored from a range of 0 to 3 to measure the level of detail in provider notes.

Quality Score	ACP Documentation
0	Complete absence of ACP discussion
1	"Did not discuss" or "None"
2	Brief discussions and notes
3	Detailed documentation of patient comments, mention of specifics

ACP Documentation Results
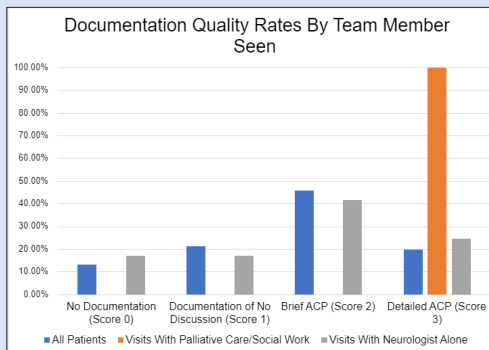
Documentation Quality Rates By Team Member Seen

61 patients were seen, of whom **33%** (20/61) saw either a **palliative care physician or social worker**, of which **100%** (20/20) had documented ACP discussions with a documentation quality score of **3**.

Patients who saw either a palliative care physician or social worker saw **higher discussion rates** compared to patients who saw a neurologist alone (41/61) across all subsets of ACP, including in AD (90% vs. 63%), OOH DNR (30% vs. 7%), and MPOA (90% vs. 59%) documentation.

Discussion, Completion, and Filing Rates in ACP Documentation
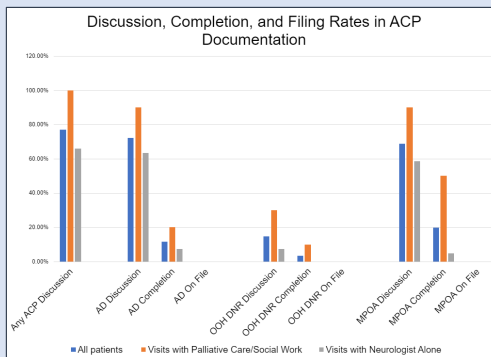
Effect on Neurologist Documentation Rate

ACP discussion documentation rate in patients who saw a **neurologist alone increased from 55% (11/20) to 81% (17/21)** following the addition of palliative care and social work to the multidisciplinary team.

Neurologist Documentation Quality Before and After Palliative Care and Social Work Implementation
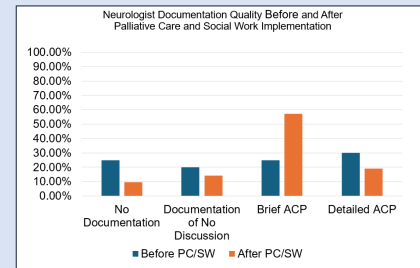
Conclusion

This study suggests that opportunities exist for **integrating palliative care and social work** into the ALS care team to **increase ACP discussion rates and documentation** among ALS patients.

The increase in the rate and quality of ACP discussion in patients who saw neurologists alone suggests that introducing team members who focus on effective ACP may **influence the rest of the multidisciplinary care team**.

Future directions will focus on measuring the effect of increased ACP documentation rates on **quality of care and patient satisfaction**.

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