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ORIGINAL ARTICLE

The Influence of Cognitive Biases on Healthcare Provider Decision-Making for Patients with Advanced Dementia

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Abstract

Background: Decision-making is at the core of clinical practice. According to traditional decision-making theory, the ideal decision maker acts rationally. However, research in cognitive biases demonstrates that decisions are not perfectly rational, and often rely on unconscious processes. This study was conducted to examine cognitive biases of medical teams when making treatment decisions in acute medical conditions for patients with advanced dementia.

Methods: This was a phenomenological qualitative descriptive study based on interviews. The interviews were analyzed to identify cognitive biases of the participants' clinical decision-making. Comparisons were made between internal medicine and surgical wards.

Results: The analysis focused on three main cognitive biases: Anchoring, availability, and representativeness. Anchoring bias was associated with professional orientation and a "default" treatment approach, with a dichotomy between surgical and internal medicine healthcare providers, between acute aggressive treatments as opposed to holistic care. Representativeness bias involved perceptions of stereotypic patterns. While most surgeons focused on the acute immediate condition, internists concentrated on end-of-life and palliative care. Availability bias was shown as a source of concerns that arose as a result of legal aspects, conflicts, and ethical dilemmas, leading to providing aggressive care that was medically futile.

Conclusions: The findings indicate that medical staff makes clinical decisions that are influenced by anchoring, availability, and representativeness cognitive biases. Recognizing biases and raising awareness of their existence can improve medical decision-making and treatment in accordance with principles that preserve patient and family preferences and choices, while maximizing quality of care.

Keywords

Advanced dementia, Cognitive biases, End-of-life, Decision-Making, Acute settings

Introduction

Clinical practice is based on decision-making that is grounded in accumulated evidence-based knowledge as well as personal experience and involves both rational and irrational thinking [1,2]. Decision making for patients with advanced dementia involves complex clinical and ethical challenges. Studies have shown that some medically aggressive treatment options may not benefit these patients, and may disagree with patient prior preferences. Healthcare providers offer these treatment options despite evidence and geriatric clinical guidelines recommending the contrary [3-7].

Kahneman's "Dual Process System" theory categorizes decision-making into one of two modes: Either intuitive, rapid decision-making that involves little effort, referred to Type 1, or analytic, slow, decision-making that utilizes significant effort, referred to Type 2. Type 1 decisions are largely unconscious and are more likely to fail, while Type 2 decisions are more reliable and safe [2,8]. According to this theory, people make sense of their world by unconsciously building models that help them perceive current events and predict the future based on their own previous experience [2]. Therefore, since each person's life experiences are different, no

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one can perceive the world in a totally objective manner, thereby creating inherent biases within our models. These biases may influence our judgment, with the potential to lead to false assumptions and reasoning. Health professional are not immune to these biases and are vulnerable to them [8]. Kahneman has labeled three of these biases as anchoring, availability, and representation bias.

The anchoring bias occurs when decisions are made while focusing and judging according to information that is prominent and familiar, in a way that prevents holistic and peripheral thinking. A decision is made based on what is known and is considered the default option [9,10]. This thinking or judgment process may derive from a professional orientation that establishes a certain perceived and accepted norm of care as mandatory. For example, specialists sometimes fail to correctly diagnose a patient because they are biased or 'anchored' by a previously recorded diagnosis given by the primary care physician. In other words, anchoring bias refers to the tendency to lock onto salient features too early in the decision-making process, and failing to adjust the initial conclusion to account for other information or different data [8].

Availability bias is created while "scanning" our memory in search of a similar case that is relevant to a new currently experienced situation. When recalled, the salient case is that which is perceived and remembered as common. Those instances that are dramatic or involve concerns, risks, or losses, are recalled more easily. These cases are more readily available consciously, causing the decision-maker to make decisions based on potentially unusual cases, creating bias. For example, if a practitioner was assaulted at work by a patient, the practitioner might consider all patients with similar demographic characteristics as violent, even though this conclusion is not true.

Representativeness is the tendency to consider a particular case as similar to all other situations classified within a certain category, based on cues, schematic thinking, classification according to fixed schemas, or prioritizing and relying on objective evidence. This classification is different from sophisticated analytical thinking that requires investment and deliberate effort [2,11]. For example, if a patient presents with three out of five symptoms or characteristics of a certain diagnosis, the practitioner might be biased and conclude that the patient has that diagnosis, even though the patient only met three of the five criteria.

Recognition of the downward trajectory of advanced dementia as a terminal illness may create emotional arousal possibly increasing professional sensitivity to recommending palliative care. On the other hand, practitioners often fear legal action when they recommend against aggressive therapy. This internal conflict can deplete cognitive resources. In this situation, the human mind prefers making decisions using system 1, involving less effort [12]. For example, extending life at any cost is an anchored medical bias that does not consider other treatment alternatives such as palliative care. Fear of conflicts or accusations such as "avoiding saving a life" with family members or colleagues, may lead to a more aggressive default treatment choice without shared discussions with caregivers about patient and family treatment preferences. Such biases are also used when practitioners try to avoid feelings of regret or guilt, therefore choosing the aggressive treatment as the familiar "safe" choice.

Awareness of potential biases to clinical decision-making for those with advanced dementia can lead to better decisions that potentially are more consistent with a patient's personal values and preferences. While the professional literature deals with the great variation of treatments, barriers to palliative care, administrative and organizational influences for this population [13], there is little attention focusing on the practitioner as the decision-maker, who is the final, and perhaps the most significant, link in this process. Given their poor cognitive status, and their inability to participate in informed decision-making, the influence of the staff on treatment decision-making increases and, therefore, examining the process of decision-making is significant for this vulnerable population.

Investigating cognitive biases in a medical context is a growing field, although focus on the geriatric population is lacking. The importance of the medical decisions' bias phenomena and its impact on patient management has begun to gain momentum in recent years. In the late 1970s, cognitive biases were initially recognized as influencing the clinical decision-making [14]. A meta-analysis from 2016 located 20 articles that focused on cognitive biases associated with medical decisions, where 35% dealt with treatment and management tasks [14]. Most studies referred generally to the phenomena. Three more recent studies examine dementia at end of life and were published from 2016 to 2018. These studies developed a set of heuristics for symptom treatment for patients with dementia, in favor of overcoming cognitive biases [15-17]. Three other studies were published between 2017-2019, discussing cognitive biases in medical management and diagnosis, mostly referring to anchoring, availability and representative biases [18-20]. No other studies were found examining practitioner biases during clinical treatment decision-making for those with advanced dementia at end of life. This study was conducted to examine the thinking processes and potential cognitive biases of medical teams when making clinical decisions associated with the use of palliative care for patients with advanced dementia.

Method

Study design

This was a phenomenological qualitative descriptive study based on interviews.

Sample

Participants were physicians and nurses working on acute Internal Medicine and General Surgery wards, at two hospitals in central Israel. Inclusion criteria were regular staff without any formal geriatric or palliative care training. A convenience sample was recruited at regular staff meetings.

Data collection

After receiving ward and hospital institutional ethics committee approval, interviews took place in the hospital at a predetermined time. A hypothetical medical case was presented, describing a scenario of an acute medical problem where a patient with advanced dementia, presents with acute abdominal pain, after 3 days of constipation and decreased appetite, followed by a CT scan that demonstrates intestinal obstruction with a suspicious tumor. Participants were asked to choose which treatments were appropriate for the patient. Treatments ranged from immediate and life-saving procedures (the "aggressive" approach) to treatment based on alleviating suffering and focusing on quality of life, (the "palliative approach"). Interviews began with an open, neutral question aimed at understanding the perceived medical scenario from the participant's perspective. All interviews were recorded and transcribed verbatim. Interviews continued until thematic saturation was obtained.

Data analysis

Two researchers (E.M; E-L.M) independently analyzed the interviews and identified cognitive biases within the participants' clinical decision-making. When there was disagreement between the researchers as to cognitive biases, a discussion was held and agreement was reached. In addition, analysis was performed, using a longitudinal and cross-sectional approach, longitudinal as throughout the interview of a single informant, and cross-sectional to examine comparisons between informants. Comparisons were also made between the internal medicine staff and surgical staff.

The analysis focused on three main cognitive biases: Anchoring, availability, and representativeness. These biases were examined in light of their influence on the therapeutic approach (palliative versus aggressive care) and barriers/facilitating factors related to the implementation of a therapeutic approach.

Ethical approval

The study was approved by the two hospital research ethics committees (case number 5535-18-SMC; 0027-19-HMO) each participant signed an informed consent form. Each interview was coded as a number in order to maintain the anonymity of the participant. The recorded and transcribed interviews were kept in a secure desktop computer with secured password accessible known only to the first author of this study (M.E) with no personal identifying information included and all data anonymized.

Results

There were 26 participants in this study, 15 nurses and 11 physicians. Respondents' age ranged from 20 to 60 years old. Most (n = 18, 69.2%) were males and Jewish (n = 21, 80.7%). Most participants were from the internal medicine ward (n = 17, 65.4%) while the remainder were from a general surgical floor (n = 9, 34.6%). The sample included both junior (n = 12, 46.2%) and senior staff members (n = 14, 53.8%) (Table 1).

Interviews time range from 9-28 minutes.

Cognitive bias 1: Anchoring

Anchored thinking involves decision-making while

Table 1: Participants' characteristics.

Characteristic		Internal Medicine Ward N = 17	Surgical Ward N = 9	Total N = 26
Role	Junior level Nurses	4	3	7
	Senior level Nurses	6	2	8
	Junior Physicians (Interns, Residents, Fellows)	4	1	5
	Attending and Senior physicians	3	3	6
Sex	Male	11	7	18
	Female	6	2	8
Age (years)	20-30	2	2	4
	31-40	7	2	9
	41-50	6	2	8
	51-60	2	3	5
Religion	Jewish	14	7	21
	Muslim	3	2	5

concentrating on a specific aspect of the case and not evaluating all options. In this scenario, one anchor was the acute health state, a specific medical problem or a disease, requiring urgent aggressive intervention, as found in the following interviews:

"Your care decisions are made upon what we learned, treatment protocols, there is only one thing that is right to do, and that is to operate. It is a medically obvious decision."(nurse, internal medicine ward)

"There are no options. You need to be aggressive and operate. Health staff are committed to save lives, no matter what, that is the one and only goal."(nurse, surgical ward).

On the other hand, another anchor was respondents' concentrating on the total patient, chronic deterioration, or an end-of-life state, requiring a palliative care approach. This anchor is found in the following interviews:

"Advanced dementia may cause death. I perceived the case as near dying, there is a place for end-of-life care." (nurse, internal medicine ward)

"This is an end-of-life case, and all aggressive treatment will be futile; we do not prolong suffering."(physician, internal medicine ward)

Differences in the anchoring biases were found between healthcare staff from internal medicine wards and surgical wards. The majority of the staff from internal medicine wards (n = 13; 76.5%) could be described as having an anchoring bias towards a holistic perspective, *"A patient with no prognosis"*, "*In poor basic terminal condition"*. On the other hand, the majority of the surgical staff (n = 7, 77.8%) were biased towards a disease-oriented view and aggressive care, saying, "*Need to do something and save life."* It should be noted that only four (15.4%) of all internal medicine staff used the disease-oriented anchor and favored aggressive treatment towards prolonging life.

One of the effects of the anchoring bias is avoidance of "out of the box" thinking and a focus on the "default" conclusion, or, an automatic passive decision that does not require resources or a comprehensive analysis. This type of thinking was found among those in favor of aggressive acute care:

"First of all, it is a surgical case. I take laboratory tests, make sure I have the blood type ready, if he is stable enough go to CT scan, and take him to the operating room…" (physician, surgical ward)

"I do a full physical examination, oriented to the abdomen, most probably followed by imaging, laboratory…not too much playing here…, he needs urgent intervention."(physician, surgical ward)

"He needs immediate help. First a gastric tube, intra-venous fluids, and then an urgent operation."(nurse, internal medicine ward)

"It is hard for me as a surgeon to sit still. Our agenda is based on doing. The default of all decisions is to do. It is the easiest decision." (physician, surgical ward)

Cognitive bias 2: Availability

The results of this study demonstrate availability bias as influenced by emotional arousal. For example, most participants described personal conflicts over ethical dilemmas. On the one hand, families demanded aggressive treatments, while they as practitioners saw these same treatments as medically futile:

"It is difficult for me to connect the basic diagnosis of dementia and end of life, in a discussion with the family. Also, cancer ... we don't like to say it. Sometimes we say "the illness". It's hard to get the message across. Frustrating. Stressful. Better not to create a negative response from the family. I experienced that a lot."(nurse, internal medicine ward)

"I frequently was involved with the issue of the 'main patient' is the family. You take care of them. There is a tension between the staff and the family. Their response…sometimes unreasonable demands. You cannot go against the family."(nurse, internal medicine ward)

"Yesterday I performed CPR on an 80-year-old woman with dementia and no therapeutic prognosis. I did not know the family. I sent the intern to discover their outlook on treatment. It turned out they understood the situation and did not ask for extending life at all costs. So we left her quietly, until a straight line appeared on the monitor." (physician, internal medicine ward)

"I remember a case of irreversible brain damage, in an elderly patient. The family kept demanding unnecessary and futile treatments. The staff explained and explained…I can understand their emotion. The bottom line is that you have to follow their treatment wishes. Many cases have the potential of creating a conflict. You do your best trying to avoid that." (physician, internal medicine ward)

Conflict between staff and family may also arise when the family challenges the availability bias and requests palliative care, against the staff's professional opinion:

"We had a patient with dementia, suffering from a major abdominal infection, with a very bad medical condition. The family, who took good care of her, asked to give only palliative care, and start morphine and sedation, to avoid suffering. I was against this treatment, because I thought that we know how to treat infections. We gave her antibiotics for three days, and she did not get any better. That moment I told the family that they were right…and we started palliative care." (physician, internal medicine ward)

Concerns about the legal consequences of treatment decisions may also invoke availability biases. This is reflected in comments related to risks or losses that are

recalled more easily and are more readily available.

"I always do everything in my power to avoid dark corners….so I go with what the family wishes."(physician, surgical ward)

"The law bothers me.. It constrains…There are potential problems with risk management. If I go for palliative care, I have to think carefully how to put it in the medical record. The most tactical way possible, not to be interpreted as giving up on the patient. A kind of self-defense and organization. I do not want to create a situation afterwards as if I did not explain, did not say, and so on." (physician, surgical ward)

Cognitive bias 3: Representativeness

There was a tendency on the part of participants to address and concentrate only on the objective evidence, in order to facilitate an appropriate care decision. All respondents were given the same scenario. However, participants concentrated on different aspects of the objective information. Some concentrated on items describing a patient in an acute medical crisis, while others honed in on descriptions of a patient at end of life. Participants concentrated on only one category, according to their particular view. No respondent reflected on both the acute medical crisis and an end-of-life scenario.

For example, evidence interpreted as an acute surgical case:

"*First of all, it is a space occupying lesion, likely to accompany intestinal obstruction that means we need to act surgically now".*(nurse, internal medicine ward)

"Obstruction, the CT scan suggests malignancy; four days of constipation…there are clear protocols."(nurse, surgical ward)

Evidence interpreted as an end-of-life case:

Nurse who works on an internal medicine ward: *"He is deteriorating. The basic condition is clear; no reserve… calls for palliative symptom management to prevent unnecessary suffering."*(nurse, internal medicine ward)

"An 80-year-old patient with no quality of life, a patient who will not benefit from surgical intervention, only prolonging suffering." (physician, internal medicine ward).

Discussion

The findings of this study demonstrate that cognitive biases were part of the goals of care, clinical decision-making associated with advanced dementia patients. These biases arose from intuitive and emotional thinking alongside rational thinking.

Professional and organizational socialization during medical training and in clinical environments can lead to anchoring biases. Often socialized behaviors and thinking processes are perceived as mandatory, default decisions [21]. These biases may lead healthcare staff to prefer familiar, socialized medical decisions, as a source of confidence and as a means of avoiding the burden of investment of time and energy in going against the majority during the decision-making process [22-24].

Anchoring biases seem to be associated with professional orientation. In this study, a dichotomy was discovered between acute, aggressive treatment concentrating on the immediate illness and end-of-life care, centered on holistic aspects, which consider possible future influences and outcomes of treatment choices. This anchoring bias results in practitioners being motivated to immediately complete specific tasks and provide the "default" treatment without further consideration of other treatment options. For example, surgeons demonstrated that they were anchored to a widely accepted professional norm, and they prepare the patient for immediate surgical intervention, derived from a unique care climate and professional socialization.

Unlike anchoring directed at the perception of a specific situation, representativeness involves perceptions of stereotypic patterns. Most surgeons interpreted the scenario as congruent with the pattern of an acute medical condition requiring immediate life-saving treatment. In contrast, most internists interpreted the scenario as aligning with the pattern with end-of-life, requiring palliative and supportive care. The perception of these patterns is based on cues, schematic thinking, and classifying the scenario according to fixed schemas, and prioritizing objective evidence [11].

Participants' representation bias was most notably found when describing the patient's status and prognosis to the family. In both cases, patterns involving suffering and the desire to avoid suffering were observed, albeit from different perspectives. Previous experience skewed the participant's perception of the scenario's details in a certain direction, based on the participant's representation of the case. Surgeons presented the case as acute and life-threatening, requiring immediate action, while internists described the same case as involving potentially futile treatment stressing the quality of life and potential harm in prolonging suffering. Surgeons referred to current suffering that must be alleviated by immediate intervention, while internists stressed future suffering.

Interviewees presented concerns that arose as a result of families' responses to their recommended treatment approach. According to this theory, exceptional, emotionally charged and traumatic cases that raise doubts are the first to be recalled leading to availability bias. It is not surprising that availability bias was found in response to these scenarios as similar real-life situations often produce conflict. Such conflict is common and results from a lack of clearly defined clinical guidelines for specific health situations, related to clinical treatments for this patient population and ethical di-

lemmas associated with providing aggressive care that is medically futile.

Interview length ranged from 9 to 28 minutes. This may be due to differences in participants' level of emotional comfort when discussing issues related to end of life and end stage dementia.

Study Limitations

The study took place in two major hospitals in Israel, in Hebrew, where the interviews were audio taped and transcribed. It may not be possible to generalize the findings to other circumstances because of the limited number of respondents, as well as possible culture factors. In addition, interviews were based on a hypothetical scenario to control for the complex hospital environment. Therefore, the responses might differ from that of real-life situations.

Recommendations

Future studies may consider including participants from different cultural and religious backgrounds, as culture may influence perceptions of end-of-life issues in advanced dementia. In addition, it is recommended that perceptions of veteran staff be further compared to those less senior, since experiences may affect the anchoring, representativeness, and availability biases. Those who train professional caregivers of patients with dementia should receive awareness training of the potential biases when making treatment decisions for this patient population.

Conclusions

Decision-making is a major aspect of clinical care. According to traditional decision-making theory, decision-makers act rationally. The Dual System Theory and cognitive biases describe decision-making as not always rational, often relying on mental unconscious processes. This study found that anchoring, availability, and representative biases, based on the dual system theory, are part of end-of-life decision making of practitioners caring for those with advanced dementia. These biases may partially explain the provision of care that sometimes is contrary to guidelines promoted by geriatric organizations [3,25-27].

This study, adds to the understanding of cognitive biases in medicine, and the effect of biases on treatment decisions for patients with advanced dementia. Awareness of these potential biases may lead to an improvement in the quality of care and decision-making. Training programs that raise the issue of cognitive clinical decision-making biases may improve the thinking processes of medical staff, while encouraging them to internally examine the extent to which they use both systems, System 1 and System 2, when making treatment decisions.

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References

1. Hajjaj FM, Salek MS, Basra MK, Finlay AY (2010) Non-clinical influences on clinical decision-making: A major challenge to evidence-based practice. J R Soc Med 103: 178-187.
2. Kahneman D (2011) Thinking fast and slow. Farrar Straus and Giroux, New York.
3. National Institute on aging (2017) End-of-Life care for people with dementia.
4. Mitchell SL, Kiely DK, Hamel MB (2004) Dying with advanced dementia in the nursing home. Arch Inter Med 164: 321-326.
5. Mitchell SL, Teno J, Kiely DK, Shaffer ML, Jones RN, et al. (2009) The clinical course of advanced dementia. New Engl J Med 361: 1529-1538.
6. Giulio P, Toscani F, Villani D, Brunelli C, Gentile S, et al. (2008) Dying with advanced dementia in long-term care geriatric institutions: A retrospective study. J Palliat Med 11: 1023-1028.
7. Tune-Boyle ICV, Sampson EL, Jones L, King M, Lee DR, et al. (2010) Challenges to improving end of life care for people with advanced dementia in the UK. Dementia 9: 259-284.
8. Croskerry P (2013) From mindless to mindful practice - cognitive bias and clinical decision making. N Engl J Med 368: 2445-2448.
9. Lockton D (2012) Cognitive biases, heuristics and decision-making in design for behavioral change. SSRN Electronic Journal.
10. Weinstein I (2002-2003) Don't believe everything you think: Cognitive bias in legal decision making. Clin L Rev, Fordham Law Legal Studies Research Paper No. 2779670. 8: 783-834.
11. Blumenthal-Barby JS (2016) Biases and heuristics in decision making and their impact on autonomy. Am J Bioeth 16: 5-15.
12. Masicampo EJ, Baumeister RF (2008) Toward a physiology of dual- process reasoning and judgment: Lemonade, willpower, and expensive rule-based analysis. Psychol Sci 19: 255-260.
13. Erel M, Marcus E-L, DeKeyser Ganz F (2017) Barriers to palliative care for advanced dementia: A scoping review. Annal Palliat Med 6: 365-379.
14. Saposnik G, Redelmeier D, Ruff CC, Tobler PN (2016) Cognitive biases associated with medical decisions: A systematic review. BMC Med Inform Decis Mak 16: 138.
15. Davies N, Mathew R, Wilcock J, Manthorpe J, Sampson EL, et al. (2016) A co-design process developing heuristics for practitioners providing end of life care for people with dementia. BMC Palliat Care 15: 68.
16. Mathew R, Davis N, Manthorpe J, Iliffe S (2016) Making decisions at the end of life when caring for a person with dementia: A literature reviews to explore the potential use of heuristics in difficult decision-making. BMJ Open 6: e010416.

17. Davis N, Manthorpe J, Sampson EL, Lamahewa K, Wilcock J, et al. (2018) Guiding practitioners through end of life care for people with dementia: The use of heuristics. PLoS One 13: e0206422.

18. Richi M, Josephson SA (2018) Quantifying heuristic bias: Anchoring, availability, and representativeness. Teach Learn Med 30: 67-75.

19. Avron J (2018) The psychology of clinical decision making - implications for medication use. N Engl J Med 378: 689-691.

20. Ozdemir S, Finkelstein EA (2018) Cognitive bias: The downside of shared decision making. JCO Clin Cancer Informa 2: 1-10.

21. Salvatore D, Numerato D, Fattore G (2018) Physician's professional autonomy and their organizational identification with their hospital. BMC Health Serv Res 18: 775.

22. Davis N, Maio L, Vedavanam K, Manthorpe J, Vernooij-Dassen M, et al. (2014) Barriers to the provision of high-quality palliative care for people with dementia in England: A qualitative study of professionals' experiences. Health Soc Care Community 22: 386-394.

23. Dening KH, Greenish W, Jones L, Mandal U, Sampson EL (2012) Barriers to providing end-of-life care for people with dementia: A whole-system qualitative study. BMJ Support Palliat Care 2: 103-107.

24. Schreiner AS, Hara N, Terakado T, Ikegami N (2013) Attitudes towards end-of-life care in a geriatric hospital in Japan. Int J Palliat Nurs 10: 185-193.

25. Van der steen JT, Onwuteaka-Philipsen BD, Knol DL, Ribbe MW, Deliens L (2013) Caregiver's understanding of dementia predicts patient's comfort at death: A prospective observational study. BMC Med 11: 105.

26. Voumard R, Truchard ER, Benaroyo L, Borasio GD, Bulla C, et al. (2018) Geriatric palliative care: A review of its concept, challenges and strategies. BMC Geriatric 18: 220.

27. Mercadante S, Gregoretti C, Cortegiani A (2018) Palliative care in intensive care units: Why, where, what, who, when, how. BMC Anesthesiol 18: 106.