




Physicians' Attitudes Toward Unnecessary Medical Services: Ethical and Systemic Challenges in Fourth Level Prevention - Tehran 2024

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Abstract

Background: The provision of unnecessary services within healthcare systems is prevalent, costly, prone to complications, and detrimental to patient care. The aim of the present study is to examine physicians' attitudes toward unnecessary tests and procedures at a referring hospital.

Methods: This study was conducted as a cross-sectional study. The sampling population comprised all physicians employed at a referral University Hospital in 2024. The study utilized a validated questionnaire to collect data over a 6-month period. Analyses were reported descriptively for qualitative variables as frequency and percentage, and for quantitative variables as mean and standard deviation. Chi-square tests and Fisher's exact test were employed for comparisons. Analyses were conducted using SPSS-22.0.

Results: A total of 196 physicians participated in the study, with a mean age of 34.69 (\pm 9.29) years and an average of 9.45 (\pm 6.36) years of clinical experience. Approximately 89.8% of the participants regarded the repetition of unnecessary tests and procedures as a significant issue within the healthcare system. About 92.3% reported that patients sometimes or rarely comply with physicians' recommendations to avoid unnecessary procedures. Furthermore, 55.1% identified patient insistence as the primary reason for prescribing unnecessary services. A substantial 83.2% of physicians believed that spending more time with patients and educating them about alternative tests or procedures would effectively reduce unnecessary services. Additionally, 81.6% of physicians considered reforms in medical malpractice follow-up to be effective in decreasing unnecessary service prescriptions, while 88.2% deemed changes to the financing system as effective in this regard. However, 90.8% reported actively working to reduce unnecessary tests. The attitude scores of specialist physicians regarding unnecessary services were significantly higher than those of residents (P -value=0.027).

Conclusion: The provision of unnecessary services poses a significant challenge within the healthcare system. The primary causes of this issue include patient insistence and physicians' fear of legal complaints. Addressing this problem necessitates systemic reforms focused on the role of physicians.

Keywords: Physicians, Attitude, Unnecessary, Health Care, Health System, Medical

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Introduction

In health systems, the interests and welfare of the patient take precedence over those of the physician and medical team (1). This significant principle distinguishes the

medical profession from other occupations. Patient welfare, grounded in fundamental needs, should serve as the foundation for medical decision-making.

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↑What is "already known" in this topic:

Evidence indicates that a significant percentage of treatment expenses is allocated to unnecessary care. Physicians play a central role in the service delivery process and the management of resource utilization. Consequently, physicians' attitudes can either facilitate or obstruct efforts to prevent costly interventions and unnecessary procedures.

→What this article adds:

According to over 90% of physicians, the provision of unnecessary services is a significant issue within the healthcare system. The primary causes of this challenge include patient insistence and fear of legal complaints. Reforming the payment system and medical malpractice laws, along with enhancing patient education, are key strategies for reducing unnecessary medical services.

Unnecessary utilization of services refers to the use of a service when it is either ineffective or when the harm outweighs its benefits (2). Evidence indicates that over 20% of treatment expenses are allocated to care that is unnecessary. The consumption of drugs in Iran ranks among the highest in the world, being 2 to 3 times higher than international standards (3). Furthermore, findings from systematic reviews and meta-analyses reveal that the frequency of unnecessary admissions and hospitalizations is also high within Iran's healthcare system, with approximately 12.3% of admissions and 11.9% of hospitalizations deemed unnecessary (4). Additionally, 65% of healthcare system costs are attributed to paraclinical services, of which over two-thirds are unnecessary (5).

The delivery of unnecessary services to patients increases the risk of adverse side effects and potential harm, thereby jeopardizing the principles of beneficence and non-maleficence (6). Additionally, the inappropriate utilization of resources, in terms of cost-effectiveness, poses a threat to health equity (7). The provision of unnecessary services may stem from physicians' fear of patient complaints; in other words, patient insistence and pressure compel physicians to conduct unnecessary diagnostic tests (8).

Physicians play a central role in the service delivery process and the management of resource utilization (9). Consequently, physicians' attitudes can either facilitate or obstruct efforts to prevent costly interventions and unnecessary procedures (10).

Given that very few studies have been conducted in the area of unnecessary services, research in this field could significantly impact cost reduction and enhance service quality. The purpose of this study was to examine the attitudes of physicians working at referring hospitals regarding the consequences and reasons for utilizing unnecessary tests and procedures, as well as strategies for prevention.

Methods

This research was an analytical cross-sectional study with an applied purpose, conducted at a referral teaching hospital in Tehran. The study utilized a validated questionnaire titled "Examining Physicians' Attitudes toward the Necessity of Providing Healthcare Services and Treatment Processes" (11).

The questionnaire consisted of two sections: demographic information (age, gender, work experience, and hospital of employment) and questionnaire items, comprising 17 questions. The first four questions assessed the first objective: examining physicians' attitudes toward the consequences of using unnecessary tests and procedures in the healthcare system. Four questions addressed the second objective: examining physicians' attitudes toward the reasons for using or not using unnecessary tests and procedures in the healthcare system. Six questions pertained to the third objective: examining physicians' attitudes toward strategies for reducing the use of unnecessary tests and procedures in the healthcare system. The final three questions explored physicians' personal views on the use of unnecessary tests and procedures. This questionnaire

has been previously validated, with a content validity ratio and content validity index of 86% and 91%, respectively, both of which are considered acceptable levels. The questionnaire's reliability was calculated using Cronbach's alpha, yielding a coefficient value of 0.84, indicating appropriate internal consistency of items (12). Using Morgan's table with a target population of 400 individuals, a 5% error level and a test statistic of 1.96, the sample size was estimated to be 196 individuals.

The sampling technique employed was random selection from the study population, which comprised all physicians working in one of the teaching hospitals in Tehran in 2024 (1403). Participants were selected through stratified random sampling from lists of various groups of physicians, including general practitioners, specialists, subspecialists, and fellows. Physicians with general practitioner, specialty, and subspecialty degrees who possessed a minimum of two years of hospital service experience were included in the study, while those with fewer than two shifts per week at the hospital were excluded. Data were collected during a 6-month cross-sectional period. Prior to the commencement of the study, informed consent was obtained from the participating physicians. Questionnaires were administered through interviews with the physicians, and upon completion of these measures, the data were analyzed using SPSS 22 software. Analyses were performed using t-tests for quantitative data, and chi-square tests for qualitative data. To assess relationships between variables based on their types, linear regressions were applied.

This study was conducted with approval from the research ethics committee and receipt of an ethics code (IR.BMSU.BAQ.REC.1403.132). Questionnaires were coded, and information was collected confidentially; informed consent was obtained from study participants before completing the questionnaires.

Results

This study involved 196 participants. The mean age of participants was 34.69 (\pm 9.29) years. The mean duration of clinical practice experience was 9.45 (\pm 6.36) years, while hospital work experience was estimated at 7.50 (\pm 6.5) years. In this study, 135 men (68.9%, CI: 62.4-75.4) and 61 women (31.1%, CI: 24.6-37.6) were included. One hundred seventy-five individuals, representing 89.3% of the study participants, had permanent employment status, while the remainder had contractual status. The majority of participants were residents (70.9%) (Table 1).

The study questionnaire was analyzed in several sections. The first section included four items related to the necessity and principles of the issue, revealing that approximately 89.8% of study participants regarded the repetition of unnecessary tests and procedures as a significant problem within the healthcare system. Among all participants, 40.8% believed these requests occurred daily, while 24% thought they occurred several times per week. Approximately 92.3% indicated that patients sometimes or rarely comply with physicians' recommendations to avoid unnecessary tests. About 24.5% of physicians reported

Table 1. Demographic Variables of Participants in the study of physicians' attitudes toward unnecessary medical services

Variable	Scale		
Age (Mean±SD) (Min-Max)	Year	34.6±9.29	25-68
Duration of Therapeutic Work (Mean±SD) (Min-Max)	Year	9.45 ± 6.36	1-43
Duration of Hospital Work (Mean±SD) (Min-Max)	Year	7.5 ±6.5	1-43
Gender (frequency) (percentage)	Male	135	68.9 (CI:62.4-75.4)
	Female	61	31.1 (CI: 24.6- 37.6)
Employment Status (frequency) (percentage)	Official	175	89.3 (CI: 85.0- 93.6)
	Contractual	21	10.7 (CI: 6.4- 15.0)
	General Practitioner	8	4.1 (CI: 1.3- 6.9)
Education (frequency) (percentage)	Resident	139	70.9 (CI: 64.5- 77.3)
	Specialist	32	16.3 (CI: 11.1- 21.5)
Group (frequency) (percentage)	Fellowship	5	2.6 (CI: 0.4- 4.8)
	Subspecialty	12	6.1 (CI: 2.7- 9.5)

Table 2. Physicians' Attitudes toward Unnecessary Tests and Procedures and Their Consequences

Questions	Responses	Number	Percentage
1. In your opinion, repetition of unnecessary tests and procedures in the healthcare system...	It is a severe problem	119	60.7 (CI:53.9-67.5)
	It is somewhat of a serious problem	57	29.1 (CI:22.7-35.5)
	It is not a very serious problem	19	9.7 (CI:5.6-13.8)
	It's not a serious problem at all	1	0.5 (CI:0.05-1.5)
2. How often in your profession do patients request tests and procedures that you consider unnecessary?	Daily	80	40.8 (CI:33.9-47.7)
	Once a week	31	15.8 (CI:10.7-20.9)
	Several times a week	47	24.0 (CI:18.0-30.0)
	Less than once a month	6	3.1 (CI:0.7-5.5)
	Several times a month	32	16.3 (CI:11.1-21.5)
3. How much do patients follow your recommendations and refrain from requesting unnecessary tests and procedures?	Always	11	5.6 (CI:2.4-8.8)
	Sometimes	139	70.9 (CI:64.5-77.3)
	Rarely	42	21.4 (CI:15.7-27.1)
	Never	4	2.0 (CI:0.0-4.0)
4. If you know that a test or procedure is unnecessary, but the patient insists on you prescribing it, do you prescribe that test or procedure...	You prescribe it	12	6.1 (CI:2.7-9.5)
	You prescribe it with the necessary recommendations	48	24.5 (CI:18.5-30.5)
	You sometimes prescribe it	97	49.5 (CI:42.5-56.5)
	You are uncertain about prescribing	15	7.7 (CI:4.0-11.4)
	You refrain from prescribing it	24	12.2 (CI:7.6-16.8)

that, upon patient request, they would prescribe tests with careful consideration (Table 2).

The second section of the questionnaire comprised four distinct items related to physicians' attitudes toward the reasons for utilizing tests and therapeutic procedures. The findings indicated that a majority of physicians, accounting for 55.1%, identified patient insistence as a reason for prescribing unnecessary services. Conversely, 91.3% reported feeling entirely or sufficiently comfortable discussing with patients the decision to refrain from prescribing (Table 3).

The third section of the questionnaire comprised six additional items concerning physicians' attitudes toward preventive solutions, specifically regarding the use of tests and therapeutic procedures. The results indicated that 51.5% of physicians often and 30.1% always feel responsible for persuading patients to avoid unnecessary services. Additionally, 83.2% of physicians believe that spending more time with patients and providing education about alternative tests or procedures is effective in reducing unnecessary services, while 51% assert that the medical community has an obligation to educate patients. Furthermore, 81.6% of physicians consider implementing reforms in the area of medical malpractice follow-up to be effective in curtailing the prescription of unnecessary services, and 88.2% view changes to the financing system as beneficial in reducing unnecessary services. This section

of the questionnaire highlighted that more than half of physicians believe that effective reforms are necessary in this area and that a reward system could significantly facilitate the implementation of these reforms (Tables 4, 5).

To complete the analysis, a comparison was made between the two groups of specialist and subspecialist physicians and residents, revealing no significant difference in attitudes between the groups in the data analysis ($P>0.05$).

To conduct a complementary analysis of the items, they were scored. Questions that did not utilize a Likert scale were excluded from the analysis. The scoring method assigned a score of +2 for very positive attitudes in 5-point items, gradually decreasing to -2 for very negative attitudes. In 4-point items, only positive and negative attitudes were taken into account. For items with yes/no responses, "yes" was assigned +1 point, while "no" received -1 point.

Multivariate linear regression was employed to examine the factors influencing physicians' attitudes. The attitude score served as the dependent variable, while independent variables included age, gender, medical work experience, employment status, job group, and comfort in communicating with patients. The results indicated that specialists had a higher attitude score compared to residents ($\beta=0.25$, $B=1.85$, $P=0.001$). Additionally, comfort in communicating with patients ($\beta=0.21$, $B=0.70$, $P=0.001$) was positively and significantly associated with improved atti-

Table 3. Physicians' Attitudes toward Reasons for Using Tests and Therapeutic Procedures

Questions	Responses	Number	Percentage
5. What is your reason for prescribing an unnecessary test or procedure?	I think that patients will make the final decision anyway	14	7.1 (CI:3.5-10.7)
		8	4.1 (CI:1.3-6.9)
	Avoiding patient confrontation		
	Patient insistence	108	55.1 (CI:48.1-62.1)
	Get more information about patient's condition with test/procedure	27	13.8 (CI:8.9-18.6)
		27	13.8 (CI:8.9-18.6)
	Not having enough time		
6. Are you comfortable with patients in cases where you avoid prescribing unnecessary tests or procedures due to financial burden on patients?	Fear of malpractice lawsuits	2	1.0 (CI:0.4-2.4)
	Existence of new technologies	0	-
	Missing	10	5.1
	I feel completely comfortable	101	51.5 (CI:44.5-58.5)
	I feel moderately comfortable	78	39.8 (CI:32.9-46.7)
7. When a patient requests an unnecessary test or procedure, what is your reason for not complying with this service request?	I feel comfortable	15	7.7 (CI:4.0-11.4)
	I don't feel comfortable at all	2	1.0 (CI:0.4-2.4)
	Always	36	18.4 (CI:13.0-23.8)
8. When prescribing unnecessary tests and procedures to patients, what is your concern regarding the burden on patients?	Most of the time	94	48.0 (CI:41.0-55.0)
	Sometimes	58	29.6 (CI:23.2-36.0)
	Rarely	7	3.6 (CI:1.0-6.2)
	Never	1	0.5 (CI:0.05-1.5)
	Always	15	7.7 (CI:4.0-11.4)
9. How do you feel about convincing patients to avoid unnecessary services?	Most of the time	66	33.7 (CI:27.1-40.3)
	Sometimes	81	41.3 (CI:34.4-48.2)
	Rarely	23	11.7 (CI:7.2-16.2)
	Never	11	5.6 (CI:2.4-8.8)

Table 4. Physicians' Attitudes toward Preventive Solutions for Using Tests and Therapeutic Procedures

Questions	Responses	Number	Percentage
9. How do you feel about convincing patients to avoid unnecessary services?	Always	59	30.1 (CI:23.7-36.5)
	Most of the time	101	51.5 (CI:44.5-58.5)
	Sometimes	32	16.3 (CI:11.1-21.5)
	Rarely	4	2.0 (CI:0.0-4.0)
	Never	0	-
10. What is your opinion about one of the following factors for raising awareness to reduce the use of unnecessary tests and procedures?	Physicians	100	51.0 (CI:44.0-58.0)
	Government	24	12.2 (CI:7.6-16.8)
	Colleagues	6	3.1 (CI:0.7-5.5)
	Patients	4	2.0 (CI:0.0-4.0)
	Institutions	49	25.0 (CI:18.9-31.1)
	Nurses	5	2.6 (CI:0.4-4.8)
	Treatment centers	8	4.1 (CI:1.3-6.9)
	Pharmaceutical companies	0	-
11. How effective is performing follow-up in the field of medical malpractice in reducing unnecessary services?	Very effective	61	31.1 (CI:24.6-37.6)
	Moderately effective	95	48.5 (CI:41.5-55.5)
	Not very effective	40	20.4 (CI:14.8-26.0)
	Not effective at all	0	-
12. How effective is the existence of clinical guidelines in reducing unnecessary services?	Very effective	80	40.8 (CI:33.9-47.7)
	Moderately effective	108	55.1 (CI:48.1-62.1)
	Not very effective	8	4.1 (CI:1.3-6.9)
	Not effective at all	0	0.00 (CI:0.0-0.0)
13. How effective is spending more time with patients and educating them about alternative tests and procedures in reducing unnecessary services?	Very effective	75	38.3 (CI:31.5-45.1)
	Moderately effective	88	44.9 (CI:37.9-51.9)
	Not very effective	33	16.8 (CI:11.6-22.0)
	Not effective at all	0	-
14. How effective is changing the financing system and providing financial incentives for avoiding the use of unnecessary tests and procedures in reducing unnecessary services?	Very effective	91	46.4 (CI:39.4-53.4)
	Moderately effective	82	41.8 (CI:34.9-48.7)
	Not very effective	23	11.7 (CI:7.2-16.2)
	Not effective at all	0	-

tudes. Age ($\beta=0.18$, $B=0.12$, $P=0.002$) and work experience ($\beta=0.22$, $B=0.25$, $P=0.001$) also demonstrated a positive, albeit weaker, relationship. The final model accounted for 42% of the variance in attitude ($R^2=0.42$, adjusted $R^2=0.40$, F-test $P<0.001$), and the assumption checks (VIF <10 , normality of residuals) supported the model's good fit.

Discussion

This study aimed to assess physicians' attitudes regarding the necessity of providing services and therapeutic processes in a teaching hospital in Tehran in 2024. The results indicate that the majority of physicians view unnecessary prescriptions as a significant issue, with greater job experience and effective communication with patients

Table 5. Physicians' Perspectives on Participation in Individual Questions (Reformative Procedures)

Questions	Responses	Number	Percentage
15. Have you taken any action in the past year to reduce the prescription of unnecessary tests or procedures?	Yes	178	90.8 (CI:86.8-94.8)
	No	18	9.2 (CI:5.2-13.2)
16. Do you intend to talk to patients in the future about avoiding unnecessary tests or procedures?	Yes	178	90.8 (CI:86.8-94.8)
	No	11	5.6 (CI:2.4-8.8)
	I have no plan	7	3.6 (CI:1.0-6.2)
17. So far, have you been questioned or have you had to read something in the case of conscious selection of equipment?	Yes	40	20.4 (CI:14.8-26.0)
	No	156	79.6 (CI:74.0-85.2)

identified as key factors in fostering a positive attitude toward reducing unnecessary prescriptions. According to the findings, approximately 90% of participants believed that the repetition of unnecessary tests and procedures constitutes a serious problem within the healthcare system, underscoring the need to address the issue of unnecessary diagnostic and therapeutic service requests by physicians. The consequences of unnecessary services in the healthcare system present a substantial challenge in Iran and other countries, a concern that has also been corroborated in nations such as Australia, Brazil, and Spain (13-15).

The provision of unnecessary services can be examined from two perspectives. First, according to the results of this study, most physicians consider patient insistence to be the primary cause of unnecessary prescriptions. Research indicates that while many scholars discuss the importance of avoiding unnecessary tests, patient insistence remains a significant driver (16, 17). Approximately half of physicians, even in the United States, report that patient demands are the primary reason for ordering unnecessary services (18). Patients pressure physicians for their peace of mind and demand additional services, while physicians perceive resistance to these pressures as challenging (19). In both basic and continuing education, emphasis should be placed on physicians' responsibility to persuade patients against unnecessary requests, considering this an ethical and professional duty of healthcare providers, particularly physicians (20).

Another issue is the practice of defensive medicine, which involves performing additional clinical services due to concerns about patient complaints and the need to protect physicians from legal lawsuits. In this study, 81.6% of physicians indicated that they would consider implementing reforms in the area of medical malpractice follow-up, while 88.2% believed that changing the financing system would be effective in reducing the prescription of unnecessary services.

The provision of unnecessary services exposes patients to harm, damages the physician-patient relationship, and undermines public trust in healthcare (21). Simultaneously, it contradicts the principle of non-maleficence toward patients (22) and undermines health equity by depleting healthcare system resources and imposing additional costs on patients (23).

Patient requests and insistence, coupled with pressures from legal lawsuits against physicians, can result in an increased prescription of unnecessary services, a phenomenon that has also been documented in studies (24).

More than half of physicians believe that the medical community has an obligation to educate patients about the complications and consequences of unnecessary services. Additionally, 83.2% of physicians consider that spending more time with patients and providing education about alternative tests or procedures is effective in reducing unnecessary services. The study conducted by Frosch and colleagues demonstrated that patients who receive health education are 30% less likely to request unnecessary services (25). Mafi's study indicated that educating patients about treatment options and the complications associated with unnecessary services resulted in a 40% reduction in requests for these services within the Medicare population of the United States. Furthermore, this study highlighted that providing transparent information regarding the costs and risks of medical services is crucial in decreasing unnecessary demand (26). Consequently, informing and educating patients can significantly alter the rate of unnecessary service requests. However, studies indicate that the relationship between patient awareness and the reduction of unnecessary services is complex and influenced by mediating variables, including cultural and social factors (27), psychological factors (28), and economic and structural factors (29). These variables can either weaken, strengthen, or even reverse the relationship between patient awareness and the reduction of unnecessary service requests. Therefore, interventions aimed at increasing patient awareness to reduce unnecessary service requests necessitate a coordinated approach that combines technical, educational, and social solutions. The awareness and attitudes of service recipients are the most critical factors in generating service demand and can be influenced by advertising that induces demand within the health system (30). The use of unrealistic advertising techniques may be deemed unethical, as patients could be swayed in their pursuit of recovery or improved health. Ethically, the information presented in advertisements should not distort reality or provide false hopes to patients (31).

In this study, more than half of physicians believe that effective reforms are necessary in this area. However, a critical finding is that, according to the study results, unilateral solutions—such as patient education—or solutions that do not encompass reforms to laws related to physician lawsuits and complaints, or changes to financial payments, are inadequate.

The research conducted by Cliff et al. indicated that simply publishing educational recommendations, such as the Choosing Wisely guidelines, has a minimal impact on

reducing low-value services, achieving only a 13% reduction. In contrast, active and multilateral interventions aimed at physicians have demonstrated success rates of up to 65%. When multiple strategies are combined—such as performance feedback, pay-for-performance based on comparisons, and electronic system alerts—the effectiveness can reach as high as 77% (32). Therefore, reforms must be systematic and multilateral.

Given the lower attitude scores of residents compared to physicians, this difference may indicate that physicians possess greater awareness and experience regarding the consequences of unnecessary services, such as system costs or patient complications. Residents in clinical environments, due to their limited expertise, heightened legal concerns, and increased focus on patient satisfaction, often lack adequate resistance to patient requests (33). This underscores the necessity of prioritizing evidence-based decision-making over the fear of legal prosecution within the hospital educational environment, while simultaneously enhancing legal support from educational healthcare systems for students.

Limitations: The operational definition of "unnecessary services" in this study—similar to many other studies—was based on the clinical judgment of the responding physician. This measurement method was selected because the ultimate decision in the clinical setting resides with the physician, whose judgment is influenced by numerous factors beyond prescribing guidelines. Although this approach introduces a limitation regarding comparability with objective studies, it accurately reflects the reality of clinical decision-making and is suitable for the purpose of the present study, which aimed to examine attitudes.

Conclusion

The provision of unnecessary services poses a significant challenge within the healthcare system. The primary contributing factors include patient insistence and physicians' fear of legal complaints. While physicians acknowledge the importance of patient education and their professional responsibility in mitigating these services, a reduction necessitates systemic and comprehensive reforms. This comprehensive approach entails reforming the payment system and revising laws related to physician and resident responsibilities, which can effectively decrease the rate of unnecessary service provision.

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Conflict of Interests

The authors declare that they have no competing interests.

Authors' Contributions

MSI conceptualized the study and designed the research methodology. ED-M contributed to manuscript writing and revisions. JM performed the systematic literature search. SB conducted data collection and analysis. MR provided overall supervision throughout the research pro-

cess. All authors approved the final version for submission.

Ethical Considerations

The study was conducted after obtaining ethical approval from the Baqiyatallah Hospital Ethics Committee at Baqiyatallah university of medical sciences (Approval Letter Number: IR.BMSU.BAQ.REC.1403.135).

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Data Availability

All data and materials of this manuscript are available from the corresponding author.

AI Use Statement

AI was used solely to improve language and readability. The author takes full responsibility for the final content.

References

- Olejarczyk JP, Young M. Patient Rights and Ethics. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025 Jan.
- Arab-Zozani M, Moynihan RN, Pezeshki MZ. Shared decision making: How can it be helpful in reducing medical overuse due to medical misinformation mess? *J Eval Clin Pract.* 2020;26(2).
- Cheraghali AM. Trends in Iran pharmaceutical market. *Iran J Pharm Res.* 2017;16(1):1.
- Arab-Zozani M, Pezeshki MZ, Khodayari-Zamaq R, Janati A. Inappropriate rate of admission and hospitalization in the Iranian hospitals: a systematic review and meta-analysis. *Value Health Reg Issues.* 2020;21:105-12.
- Pezeshki MZ, Pezeshki S. Educating Quaternary Prevention (P4) in Iran for decreasing the harms and costs of unnecessary services in clinical medicine and public health. *Payesh.* 2013;12(4):329-33.
- Baskin AS, Wang T, Miller J, Jagsi R, Kerr EA, Dossett LA. A health systems ethical framework for de-implementation in health care. *J Surg Res.* 2021;267:151-8.
- Weatherly H, Drummond M, Claxton K, Cookson R, Ferguson B, Godfrey C, et al. Methods for assessing the cost-effectiveness of public health interventions: key challenges and recommendations. *Health Policy.* 2009;93(2-3):85-92.
- Mitrasevic M, Radovanovic S, Radevic S, Maricic M, Macuzic IZ, Kanjevac T. The unmet healthcare needs: evidence from Serbia. *Iran J Public Health.* 2020;49(9):1650.
- Denis JL, Van Gestel N. Medical doctors in healthcare leadership: theoretical and practical challenges. *BMC Health Serv Res.* 2016;16(Suppl 2):158.
- Reid RO, Tom AK, Ross RM, Duffy EL, Damberg CL. Physician compensation arrangements and financial performance incentives in US health systems. *JAMA Health Forum.* 2022;3(1):e214634.
- Ungureanu G, Alexa I-D, Ungureanu M-C. Unnecessary Medicine, An Issue With Major Ethical Implications. *Intern Med.* 2018;15(5):65-74.
- Farhadi F, Khodayari R, Mobarak Z, Arab-Zozani M. Physicians' Attitudes toward Unnecessary Tests and Processes in the Health Care Delivery System; a Cross-Sectional Study. *Health Res J.* 2021;6(2):115-24.
- Barros AJ, Santos IS, Matijasevich A, Domingues MR, Silveira M, Barros FC, et al. Patterns of deliveries in a Brazilian birth cohort: almost universal cesarean sections for the better-off. *Rev Saude Publica.* 2011;45:635-43.
- Elshaug AG, Watt AM, Mundy L, Willis CD. Over 150 potentially low-value health care practices: an Australian study. *Med J Aust.* 2012;197(10):556-60.

15. Aguillar VLN, de Mello GGN, Tucunduva TdMC, Aracava MM, Oliveira EC. Evaluation of atypical hyperplasia after percutaneous vacuum-assisted biopsy of suspicious calcifications. *Mastology*. 2020;30:38.
16. Koch C, Roberts K, Petrucci C, Morgan DJ. The Frequency of Unnecessary Testing in Hospitalized Patients. *Am J Med*. 2018;131(5):500-3.
17. Mira JJ, Carrillo I, Silvestre C, Pérez-Pérez P, Nebot C, Olivera G, et al. Drivers and strategies for avoiding overuse. A cross-sectional study to explore the experience of Spanish primary care providers handling uncertainty and patients' requests. *BMJ Open*. 2018;8(6):e021339.
18. Zheng J, Lu Y, Li W, Zhu B, Yang F, Shen J. Prevalence and determinants of defensive medicine among physicians: a systematic review and meta-analysis. *Int J Qual Health Care*. 2023;35(4).
19. Teo WZ, Brenner LH, Bal BS. Medicolegal sidebar: unnecessary medical care and physician liability. *Clin Orthop Relat Res*. 2018;476(12):2322-4.
20. Daar J. Physician autonomy or discrimination: the risks and limits of saying "no". *Fertil Steril*. 2021;115(2):263-7.
21. Bester JC. Defensive practice is indefensible: how defensive medicine runs counter to the ethical and professional obligations of clinicians. *Med Health Care Philos*. 2020;23(3):413-20.
22. Varkey B. Principles of clinical ethics and their application to practice. *Med Princ Pract*. 2021;30(1):17-28.
23. Cookson R, Mirelman AJ, Griffin S, Asaria M, Dawkins B, Norheim OF, et al. Using cost-effectiveness analysis to address health equity concerns. *Value Health*. 2017;20(2):206-12.
24. Dindeh Z, Karimi SE, Hosseini SM, Nafei A. The Frequency and Causes of Unnecessary Medical Services in Urmia, Iran: Strategies and Control. *J Kermanshah Univ Med Sci*. 2021;25(3).
25. Frosch DL, Kaplan RM. Shared decision making in clinical medicine: past research and future directions. *Am J Prev Med*. 1999;17(4):285-94.
26. Mafi JN, Reid RO, Baseman LH, Hickey S, Totten M, Agniel D, et al. Trends in low-value health service use and spending in the US Medicare fee-for-service program, 2014-2018. *JAMA Netw Open*. 2021;4(2):e2037328.
27. Elshaug AG, Rosenthal MB, Lavis JN, Brownlee S, Schmidt H, Nagpal S, et al. Levers for addressing medical underuse and overuse: achieving high-value health care. *Lancet*. 2017;390(10090):191-202.
28. Beckers T, Craske MG. Avoidance and decision making in anxiety: An introduction to the special issue. *Behav Res Ther*. 2017;96:1.
29. Derakhshan Z, Larijani B, Shamsi-Gooshki E, Salari P. Presenting a comprehensive definition of unnecessary healthcare services and their drivers: a systematic review and meta-synthesis. *Med J Islam Repub Iran*. 2023;37:106.
30. Keyvanara M, Karimi S, Khorasani E, Jafarian Jazi M. Challenges resulting from healthcare induced demand: A qualitative study. *Health Inf Manag*. 2013;10(4):538-48.
31. Solomon M, Radu G, Hostiu C, Margan MM, Bulescu IA, Purcarea VL. Ethical issues in advertising and promotion of medical units. *Rom J Ophthalmol*. 2016;60(4):216.
32. Cliff BQ, Avancena AL, Hirth RA, Lee SY. The impact of choosing wisely interventions on low-value medical services: a systematic review. *Milbank Q*. 2021;99(4):1024-58.
33. O'Leary KJ, Choi J, Watson K, Williams MV. Medical students' and residents' clinical and educational experiences with defensive medicine. *Acad Med*. 2012 Feb;87(2):142-8.