




Presenting a Comprehensive Definition of Unnecessary Healthcare Services and Their Drivers: A Systematic Review and Meta-synthesis

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Abstract

Background: Providing unnecessary healthcare services is a major common problem in every health system. The scope and cause of healthcare services must be identified in order to be managed and controlled. Finding the most complete definition of the problem and its causes are the goals of this meta-synthesis.

Methods: A comprehensive search strategy was performed using a wide range of keywords and databases. Based on the defined inclusion and exclusion criteria, 22 articles were selected for content analysis and meta-synthesis. The Graneheim and Lundman method was used for content analysis. The MAXQDA software Version 18.2.0 was used for the first round of content analysis. Content analysis and meta-synthesis were used to comprehensively define the term “unnecessary healthcare services” and find the etiologic factors driving healthcare providers to unnecessary healthcare services.

Results: The term “unnecessary healthcare services” is defined as “overproviding healthcare services that could be harmful, low-value, insufficient, and inappropriate.” The etiologic pattern of unnecessary healthcare services shows intrinsic and extrinsic factors as a driving force for unnecessary healthcare services.

Conclusion: A multilayer strategy for efficient management and prevention of unnecessary healthcare services is appropriate due to the multifaceted character of these services. This approach consists of the modification of the intrinsic factors and extrinsic drivers.

Keywords: Unnecessary Healthcare, Pharmaceuticalization, Ethics, Overdiagnosis, Overtreatment

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Introduction

The recent advancements in biomedical sciences and technologies induce their implication in diagnosis and treatment. Although health technologies are essential tools for the diagnosis and management of health problems, the high speed of their development causes pressure to use the new health technologies more and more toward overuse and unnecessary uses (1). Furthermore, the demo-

graphic changes and aging population in the world induce the need to use more technologies, which can be an essential reason for overuse (2).

Unnecessary healthcare (overutilization, overuse, or overtreatment) is provided with a higher volume or cost than is appropriate or clinically rational (3). Overuse accounts for about 6% to 8% of all healthcare expenditure in

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↑What is “already known” in this topic:

This topic has been defined differently; its definition has yet to comprehensively define the unnecessary services and their dimensions. With this, the problem of providing unnecessary services and its high burden on the health system still needs to be solved.

→What this article adds:

In this study, a new comprehensive definition of unnecessary services has been introduced. Furthermore, its etiology was discovered concerning the intrinsic and extrinsic factors that drive the provider or the patient to unnecessary services. The findings of this study help us having a directed approach toward specific modifications for decreasing the provision of unnecessary health services and their burden.

the United States (4). Irrational use of medicines is a significant problem worldwide. The World Health Organization estimates that half of all drugs are prescribed inappropriately, and half of all patients fail to take them correctly (5). The overuse and irrational use of medicines waste scarce resources and cause health hazards (6). Brownlee et al believe that overuse is a form of invasive treatment that will not provide significant clinical benefits to the patient (7).

Akbari et al reported that 55.9% of Iranian patients had undergone diagnostic unnecessary ultrasonography that was affected by SID (Supplier-Induced demand) (8). Studying the Medicare database, Falchook et al showed that in the United States, 21% and 48% of prostate cancer patients with low and moderate risk undergo bone scans unnecessarily, which is contrary to the standard recommendations and that is unlikely to yield clinically appropriate information while it augmented the costs by about the US\$11,300,000 per year (9). The study by Zargar Balaye et al in Iran showed that half of the patients with low back pain referred to radiology clinics for magnetic resonance imaging (MRI) had no indication (10). Bahadori indicated that most cesarean sections in Iran are not medically indicated, and the rate of cesarean sections grew from 35% in 2000 to 48% in 2009 (11).

Overuse is interchangeably utilized with unnecessary healthcare services; it has been defined differently, and there is no comprehensive definition to show all its details and dimensions. Overuse is sometimes described as using a service that does not appear to improve the quality and quantity of life while it causes harm. According to Saini et al, unnecessary service is “the provision of a service that is unlikely to increase the quality or quantity of life, which poses more harm than benefit” (12).

The usage of medical interventions that are not necessary is a serious problem. Indeed, it has negative consequences, including side effects, high costs, wasting time, and ignoring patients’ preferences, according to the American Society of Internal Medicine (13).

Overuse increases the cost of care and its burden on the health system (14). In the United States, nearly 30% of the healthcare costs are unnecessary (15). Considering healthcare costs as the percentage of Gross Domestic Product, in the United States, overuse is the predominant factor in its expense, accounting for about one-third of its healthcare costs (\$750 billion out of \$2.6 trillion) in 2012 (16). Unsuccessful tests and overuse of imaging not only impose a heavy economic burden on society but also restrict patients’ access who are in need, impose acute risks without providing benefits, and do not increase (or possibly reduce) the quality of care (17, 18).

Allocation of scarce resources is a significant problem worldwide, especially in low- and middle-income countries (7). It is estimated that 60% and 70% of medicines prescribed in public and private health services, respectively, in developing countries could be a source of waste of health resources (19). Iran, as a middle-income country, has a limited budget for healthcare services. Considering the drawbacks of unnecessary use of healthcare services, policymakers should govern their usage (1, 20). Psycho-

logical harm and disease labeling as the other adverse effects of unnecessary healthcare services should not be ignored (21).

From an ethical point of view, physicians are responsible to do no harm and benefit the patients, while overuse of health technologies may harm patients, the health system, and the community. Ralston and Schroeder believe that considering “overtreatment as an ethical violation “could help see the conflicting incentives of healthcare workers for treatment or not treatment (21). Sometimes, paraclinical diagnostic examinations have false-positive results that lead to more referrals and repeated testing; consequently, it violates the principles of non-maleficence and justice (22). The physician should be a double agent person to be able to fulfill his duty as a patient advocate when tasked with the allocation of limited resources (23, 24). In addition, from the justice point of view, overdiagnosis is mainly more significant for patients with higher socioeconomic levels who have insurance coverage (25).

In reaction to unnecessary healthcare services, some movements flourished globally, including “Choosing Wisely,” “Slow Medicine” (in the Netherlands, Brazil, and Italy), “Quaternary prevention” (in Belgium), and “Do not Do” (in the UK). “Choosing Wisely” emerged in North America in 2010 (26). In 2012, the campaign “Choosing Wisely” created a movement toward the appropriate use of procedures and treatments in medicine to tackle medicine overuse worldwide (27, 28).

One of the key elements in taking new health technologies under control and managing unnecessary healthcare services is finding the most accurate definition of overuse, followed by exploring the etiology and the reasons behind their prescriptions. Therefore, this meta-synthesis is the first part of a PhD dissertation in medical ethics that aims to find the best comprehensive definition of the issue and its etiology.

Methods

Meta-synthesis attempts to integrate studies from several different but interrelated qualitative studies. In contrast to the meta-analysis of quantitative studies, the technique has an interpretative rather than aggregating intent. Meta-synthesis is a critical technique using qualitative studies to deepen our understanding of the contextual dimensions of an issue in healthcare (29). Meta-synthesis tries to understand and describe the phenomena.

Scope of the Study

Unnecessary healthcare services, in terms of medications and paraclinical examinations, have a broad definition that may vary from one context to another. To reach the best comprehensive report, all selected articles were read, their contents were analyzed, and definitions from different scopes were gathered and synthesized to understand the issue and its influential factors better.

Search Strategy

An extended, systematic literature review was conducted to identify eligible studies on unnecessary healthcare services in medicine and paraclinical examinations. To

Table 1. The applied syntax

Database	Search strategy
PubMed	Unnecessary or inappropriate low-value or misuse AND Use or assessment treatment or, prescription or, investigation or, testing or diagnosis or utilization medicalization or, lab tests care or, imaging or medication or radiological investigations or prescribing or pharmaceuticalization or procedures or screening detection or detect or screen or therapeutic techniques or AND Ethics or healthcare or ethical or moral or health system or general practice or healthcare services or medical AND Perception or attitude or knowledge or practice

Table 2. Eligibility of literature included in the meta-analysis

Inclusion criteria	
Types of the literature	Peer-reviewed studies, PhD dissertations, books
Publication language	English, Persian
Study design	At least one of the following study designs: retrospective study, meta-synthesis, meta-analysis, review, narrative review, systematic review, qualitative study
Data collection	At least one of the following topics should be used: interview, population-based survey (patient and service user), facility survey (health providers, pharmacies, and health officials)
Exclusion criteria	
Publication Type	Commentary, editorial, letter to the editor, lecture
Study design	All the studies that were not qualitative
Duplications	If two or more studies share similar databases

search the literature, the databases including PubMed, Web of Sciences (ISI), Scopus, Proquest, Cochrane, Embase, and Scientific Information Database (SID) were searched. SID is an Iranian scientific database. The data collection was performed from April 2020 to June 2022. The search into gray literature, including books, dissertations, and unpublished data, was done; the citation list of the articles was overseen for the expansion of the investigation. To retrieve all the relevant qualitative studies and do a robust search on the topic, the syntax was implicated in Table 1.

The article's language was limited to English and Persian. No time limit was considered.

Study Selection

The eligibility of the literature was presented based on the inclusion and exclusion criteria shown in Table 2.

At first, 3055 articles were extracted; after omitting duplicates, nonrelevant articles, and quantitative studies, 22 articles remained for meta-synthesis (Figure 1).

Quality Assessment

Since the studies of different designs were included in the meta-synthesis, the checklist from the critical appraisal skills program (CASP) was used to assess the quality of the final studies included in the meta-synthesis. The CASP tool was developed to help critically appraise different types of evidence (30). The Graneheim and Lundman method was used for content analysis. The MAXQDA software Version 18.2.0 was used for the first round of content analysis (31). Finally, content analysis of the data was facilitated through MAXQDA 2018 software. To improve the study, data analysis was done manually.

Results

Description of Studies

Of 26 retrieved articles, 4 records were excluded ac-

cording to the CASP checklist, and finally, 22 articles were included in the meta-synthesis. The summary characteristics of the included studies are shown in Table 3.

The quality of studies varied based on poor reporting sample selection, sampling method, and data analysis.

Findings on the Definition of Unnecessary Healthcare Services

Focusing on the study objectives, a thematic synthesis approach was used. The units of meaning within and across studies were used to synthesize intuition from studies and describe the themes. The themes were considered

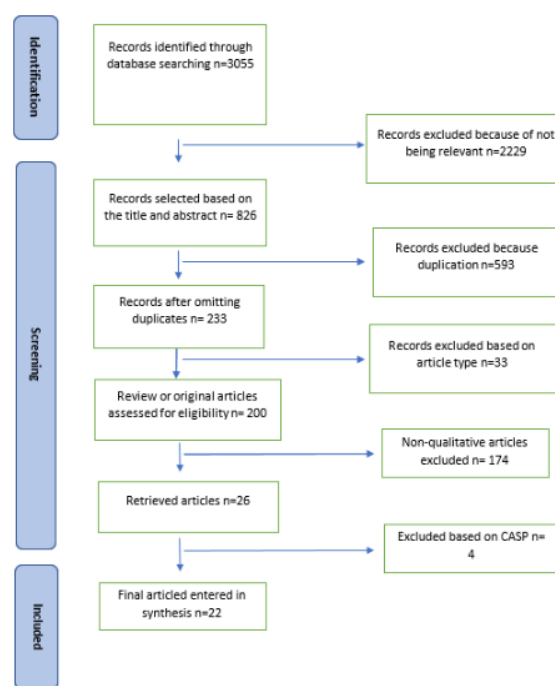


Figure 1. PRISMA flow diagram for paper selection

Table 3. The summary characteristics of the included studies

Author	Year, Country	Subject	Population	Data collection method	Analytic approach
Lysdahl et al (32)	2009, Norway	Etiology of over-imaging	radiologists	Questionnaire method	Descriptive analyses
Palesh et al (1)	2010, Iran	Overuse of MRI	Policymakers in different positions	qualitative explorative study	Framework approach
McKay et al (33)	2011, Canada	Antibiotic overuse and resistance	Children, students, and their parents And health care professionals	Action research	McNemar test
Dew et al (34)	2014, New Zealand	Moral responsibility in antibiotic use	Households	Ethnography	inductive process
Sanchez et al (35)	2014, USA	Appropriate selection of antibiotic	Physicians, nurse practitioners, and physicians assistants	KAP study	in-depth analyses of themes
Zargar Balaye Jame et al (10)	2014, Iran	Inappropriate use of MRI	patients	questionnaire	Statistical analyses
Kazemian et al (36)	2015, Switzerland	Ethical perspective	dentists	vignette describing	one-way variance analysis
Moynihan et al (37)	2015, Australia	Mean of overdiagnosis	Australian adults	Content analysis and telephone survey	constant comparison method
Cabral et al (38)	2015, England	Overuse of antibiotic	Parents, general practitioners, and nurse practitioners	cross-study analysis	inductive approach
Broom et al (39)	2015, Australia	Misuse of antibiotic	Australian pharmacists	phenomenology	inductive approach
Car et al (40)	2016, England	Medication error	primary care clinicians	novel priority-setting method and content analysis	Open coding
Zhang et al (41)	2016, China	Antibiotic resistance	Village doctors	KAP study	thematic analysis technique
Zikmund-Fisher et al (42)	2016, USA	Choosing wisely	Primary care providers	Email survey	Statistical analyses
Hensher et al (43)	2017,-	Economic perspectives	-	novel synthesis	review
DuBois et al (44)	2017, USA	Legal consequences	-	mixed-methods design	two-step cluster analysis
Lyu et al (20)	2017, USA	Etiology and approach to overtreatment	All doctors in AMA	Online survey	Statistical analyses
Okpala et al (45)	2018, USA	reduce healthcare costs	-	grounded theory	open-coding approach
Martin et al (46)	2018, USA	Ethical issues in over-use	Lay persons, patients, and physicians	qualitative analysis of comments	Content analysis
Stol et al (47)	2018, the Netherlands	Health screening	Lay people	focus groups	Bottom-up coding
Opdal et al (48)	2019, Norway	Prevent over-testing	General physicians	Interview and focus group	critical incident technique
Parchman et al (49)	2020, USA	Engaging providers to address overuse	Clinicians	Action research	Identifying themes and triangulating
Verkerk et al (50)	2021, USA, Canada, the Netherlands	Reduce low-value care	Experts on low-value care	Semi-structures interview	Inductive thematic analysis

to create the thematic network for simplifying the relationships between themes. The thematic network helps to evidence themes against specific statements from included studies and explore the relationships. Drawing on the synthesis of qualitative research makes interpreting and understanding the underlying process possible as part of an integrated, unique scheme. The Graneheim and Lundman method was used for content analysis (31). The MAXQDA software Version 18.2.0 was used for the first round of content analysis. The article's main sections and representative quotations corresponding to each theme were documented for each study. The research team discussed extracted themes and multiple mappings of the network until they reached a consensus on a network with the dominant explanatory potency.

A hierarchical model of theme-subthemes of the definition of unnecessary healthcare services is presented in

Figure 2. The figure summarizes the themes and sub-themes achieved through analysis and their inter-relationships.

The figure shows that the general title of “unnecessary healthcare services” is divided into 5 main themes, including “over-use,” “harmful services,” “low-value care,” “insufficient services,” and “inappropriate services.” The “over-use” theme consists of 3 subthemes, including “overdiagnosis,” “overtreatment,” and “overmedicalization.” “over-diagnosis” includes “overtesting” and over-imaging; both together account for “overdiagnosis.

The term “overdiagnosis” has been defined as “undiagnosed—would never have caused patients harm” (43), “a person is diagnosed with a disease that would not have harmed him,” and “diagnosing a condition to be more serious/severe than what it is,” “diagnosing something not there,” “diagnosing a condition that the person does not

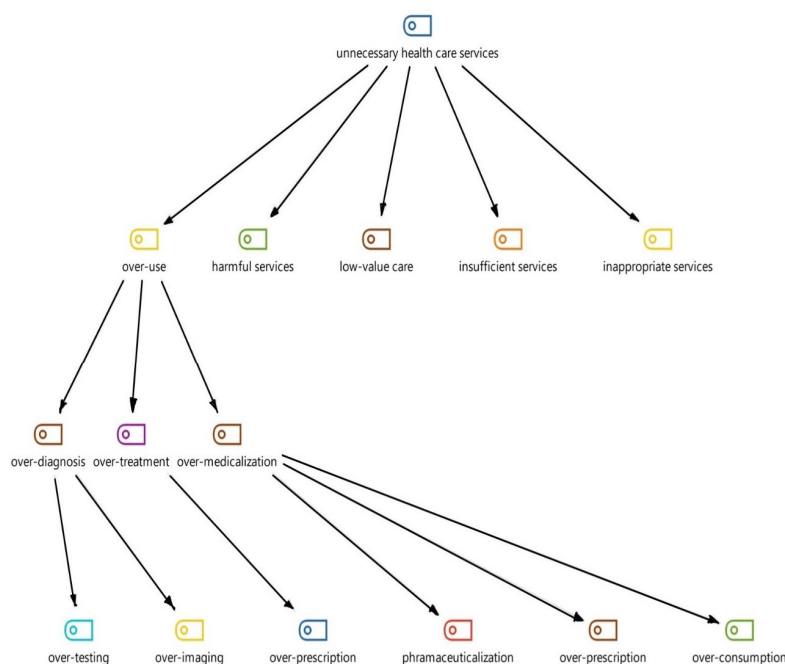


Figure 2. The hierarchical code-subcodes model of the definition of unnecessary health care services

have,” “physicians making a diagnosis more frequently than what is needed” and “providing too many unnecessary diagnoses,” and “providing too many unnecessary tests to get a diagnosis” (37).

The “overtreatment” has a cousin called “overprescription,” while a little bit different. Finally, “overmedicalization” seems to be similar to “pharmaceuticalization”; however, “overprescription” and “overconsumption” are derived from it. Across studies, “overtreatment” was illustrated as the “use of unnecessary clinical services or interventions that provide negligible benefit, “a poor benefit to risk profile are provided to patients, “provide no significant benefit and may also cause harm, “treatments should never be considered as needed”(43), “putting a patient through some medical or surgical procedures when there is little or no evidence that such procedures will improve the patient’s health outcome“ (36), and “unnecessary medical interventions and services provided”(37).

The “pharmaceuticalization” was explained as “the transformation of human conditions, capabilities, and capacities into opportunities for pharmaceutical intervention,” “situations in which medicine use ceases to be rational, fails to confer benefits,” and “risks and harms without concomitant benefits” (43).

The term “harmful services” brings different meanings to mind, including “expose patients to risks of harm,” “cause harm,” “risks outweigh benefits,” “in certain situations, harmful,” and “may reduce overall benefits through causing harm” (43).

In accordance with our findings, “low-value care” is explained as “incorporating aspects of cost or value,” “little to no clinical utility,” and “to provide minimal or no bene-

fit on average” (43).

The theme of “insufficient services” was presented as “inefficient use of health care resources” and “care that is less effective and more costly than available alternatives”(43). “Inappropriate services” are considered “without indication”(10).

The meaning of “overprescribing” is explained as “prescribing too many medications” (33), and the definition of “overconsumption” has been achieved as “the high amount of consumption by patients that undermines their own well-being” (43).

In the first step, healthcare services are considered diagnostic services (testing and imaging) and pharmacologic treatments. Accordingly, and to synthesize, the comprehensive definition of unnecessary healthcare services could be presented as “overproviding healthcare services that could be harmful, low-value, insufficient, and inappropriate.”

Findings on the Etiology of Unnecessary Use

Studying the etiology of unnecessary healthcare services directed us to 2 different patterns—intrinsic and extrinsic. Based on the driving force, each one is divided into provider-driven and patient-driven. More details are presented in Table 4.

Intrinsic Factors

The content analysis showed that induced demand, conflict of interests, personal and professional characteristics, poor communication skills, physicians' nonadherence to evidence-based medicine, and defensive medicine could be physicians' driving force for unnecessary healthcare

Table 4. The etiologic factors of unnecessary healthcare services

Intrinsic	Extrinsic
Provider driven	Provider driven
Induced demand	Induced demand
<ul style="list-style-type: none"> Imbalance of knowledge and power between physician and patient 	<ul style="list-style-type: none"> Supplier-induced demand Patient insurance coverage Medical culture
Conflict of interest	Payment mechanisms
<ul style="list-style-type: none"> Financial incentives (self-referral, fee-splitting) Positional competition Fear of losing patients Desire for fame and reputation 	<ul style="list-style-type: none"> Fee-for-service Case-based Per diem payment systems
Personal and professional characteristics	Development of new technologies
<ul style="list-style-type: none"> Desire to minimize regret Oversight failure Poor problem solving Ambition Mental illness Carelessness Substance abuse Stress Retaliation Achieve high patient satisfaction Reassurance Rely on investigations 	<ul style="list-style-type: none"> Overwhelmingly adopting new technology Inflationary increases in investment in technology Increased availability and access to the latest technologies
Poor communication skills	Industries
Non-adherence to evidence-based medicine	<ul style="list-style-type: none"> Increased utilization by industries Healthcare marketing Advertising by pharmaceutical companies
<ul style="list-style-type: none"> Limited knowledge Uncertainty of the diagnosis and management Absence, misuse, or misunderstanding of evidence-based medicine Prescribing without indication 	Practice guidelines or norms
Defensive medicine:	<ul style="list-style-type: none"> Ambiguous practice guidelines or norms Unavoidable uncertainty and variations in practice Realization of the patients' rights Medicalization Widening disease definitions Screening programs
<ul style="list-style-type: none"> Fear of litigation Fear of malpractice 	Corruption of moral and professional climate
Patient driven:	Documentation
<ul style="list-style-type: none"> Parents' expectations or pressure Patients' "Jealousy" consumption behavior Patients vulnerability 	<ul style="list-style-type: none"> Difficulty in accessing prior medical records Incomplete healthcare documentation Increased demand for documentation
	Systems of practice
	<ul style="list-style-type: none"> Inadequate time Physicians' dual practice (public and private sectors) Competing organizational priorities Pressures from other healthcare professionals Medical culture
	Patient driven
	<ul style="list-style-type: none"> Patient's fascination for technological innovations (Public culture)

services (34, 38, 39, 50). It is suggested that the knowledge imbalance between physician and patient can induce the demand (43). Being in the situation of conflicts of interest, whether financial or nonfinancial, may influence healthcare providers' clinical behavior. The economic incentives such as self-referral or fee-splitting and nonfinancial conflicts of interests, including positional competition, desire for fame and reputation, and the fear of losing patients are potential contributory factors (43). When positional competition permeates the principal-agent relationship in healthcare, it "provides a further possible force driving overuse," according to the statement (43).

Having personal and professional characteristics in mind, "some clinicians tend to rely on investigations more than others, and some patients take comfort in being investigated" (32). DuBios et al consider fame and money as important motives. At the same time, personal characteristics such as a desire to minimize regret, lack of oversight, poor problem-solving, ambition, mental illness, carelessness, substance abuse, stress, and retaliation are also influential (44). Due to the patient's belief that more

healthcare is better than less healthcare, some clinicians desire to keep patients happy (32), so they try to reassure patients (42).

Poor communication between clinicians and patients could propagate the condition (40, 42). Physicians' non-adherence to evidence-based medicine limits their scope of practice (43) and creates uncertainty in the diagnosis and management (41). Also, misuse or misunderstanding of evidence could be noteworthy (36). Thus, the physician prescribes medications without adequate indication (1) and repeats prescribing without proper review (40).

The other important reason is physicians' defensive medicine; because of physicians' fear of litigation or malpractice, physicians prefer to do more (20, 41).

From the patients' side, expectations or pressure increased demands, jealousy consumption behavior, and patients' vulnerability are considered to intrinsically persuade patients to demand unnecessary healthcare services. Patients' preferences to do more for better care (35, 36, 41, 42) or increased demands due to unknown reasons (20, 32) are remarkable.

Extrinsic Factors

The extrinsic factors could induce demand for unnecessary health care services while the payment mechanisms, the ever-increasing development of new technologies, the industries, practice guidelines, corruption of moral and professional climate, documentation, and systems of practice have a remarkable impact (45-49). Medical culture has a great effect, and public health screening programs may differ due to culture because every culture may have a different insight on diseases that affects our approach to diagnosis and management. It is assumed that "those with insurance will consume more healthcare than uninsured patients" (43). Furthermore, supplier-induced demand affects physicians' prescription behavior.

Payment mechanisms, whether fee-for-service, case-based, or per case, are considered to impact physicians' prescriptions (36, 43, 44). Furthermore, the overwhelming adoption of new technologies because of the rapid advancement in technology, inflationary rises in investment in technology, and availability and access to the latest technologies (10, 32, 37, 43) tempt physicians to overprescribe. The external pressure caused by the promotion of technology by industries due to their marketing activities also contributes to overtesting and overtreatment (36, 43).

Practice guidelines or norms, especially when there is unavoidable uncertainty, could act as a significant force driving variations in practice (43, 44).

Patients' excitement with technological advancements may be an important, culturally based component in driving up demand. Across all factors, patients, regardless of the extrinsic or intrinsic factors, seem to have a marginal influence on physicians' prescription behavior.

The common feature of all these factors is that they present physician's nonadherence to their professional principles—the impact of conflicts of interests, personal and professional characteristics, poor communication skills, nonadherence to evidence-based medicine, defensive medicine, and practical guidelines—systems of practice, documentation, monetary policies, and advancement of new technologies.

Discussion

To control unnecessary healthcare services and their negative consequences, having a clear and comprehensive definition of the term overuse and unnecessary use is necessary. A synthesis of the most important findings of this study can be summarized in a broad definition of unnecessary healthcare services and their causes. Accordingly, the term "unnecessary healthcare services," which is used throughout the article, is defined as "overproviding healthcare services that could be harmful, low-value, insufficient and inappropriate". It's interesting to note that this definition classifies healthcare services as diagnostic (testing and imaging) and pharmacologic treatments, despite the fact that there are many different types of treatment available, including surgical, physical, radiation, et cetera. Overuse of medications is a synonym for pharmaceuticalization that results from aggressive industry promotion and marketing activities. Elbe et al believe that the

government has an exceptional role in pharmaceuticalization (51).

The etiologic patterns of unnecessary healthcare services show that patients may partially influence physicians' prescription behavior. Furthermore, the etiological factors intrinsically and extrinsically drive physicians' prescription behavior, which include physicians' nonadherence to their professional principles (the impact of conflicts of interests, personal and professional characteristics, poor communication skills, nonadherence to evidence-based medicine, defensive medicine, practical guidelines), systems of practice and documentation, monetary policies, and advancement of new technologies. The interactions between the intrinsic and extrinsic factors were presented in a concept map in Figure 3.

Considering the impact of patients on physicians' prescription behavior, the role of autonomy in unnecessary healthcare services is taken into account, whether as patients' or physicians' autonomy. Respect for patient autonomy in every physician-patient relationship necessitates patients shared decision-making and considering the patients' interests and requests, which could be one of the essential causes of overuse as patients' pressure to do more (40, 52). physicians' professional commitment is also of significant importance. That gives the physician the authority to decline patient's request to provide healthcare services for medical reasons. This is true when the patient's request is in conflict with the patient's health and healthcare standards without benefiting the patient (53). The physician's professional commitment gives them the right to refuse to provide the requested care when it conflicts with their professional standards (53). However, physicians who decline specific patient's requests may face sanctions from professional organizations and licensing bureaus as well as a legal recession (28). Physicians' refusal to provide the healthcare requested by patients is similar to walking on the razor's edge because it raises significant concerns about patient well-being and the medical profession (54). The physician may choose to incorporate defensive medicine into his daily routine because he finds it more approachable and is prepared to stand up for it; yet, physicians can lose their primary function as the only givers of medical care, further marginalizing them (55). Physicians' fear of litigation and its untoward complications is a driving force for positive defensive medicine that augments overuse (20, 40, 53). Bester believes that defensive medicine is unprofessional, unethical, and in conflict with the nature of medicine, and it is because of the malpractice-minded environment that leads to unnecessary healthcare services (56). Furthermore, Bester considers defensive medicine against the patient's autonomy (56). Van Dijk et al believe that sociocultural processes from in and outside medicine act as the drivers of overdiagnosis (57) under the control of the patient's autonomy.

Physicians' nonadherence to evidence-based medicine may come from limitations in evidence application, such as cognitive biases and errors, representative bias, and availability bias (58). Van Bodegom-Vos and Marang-van de Mheen's findings are in accordance with ours, and they

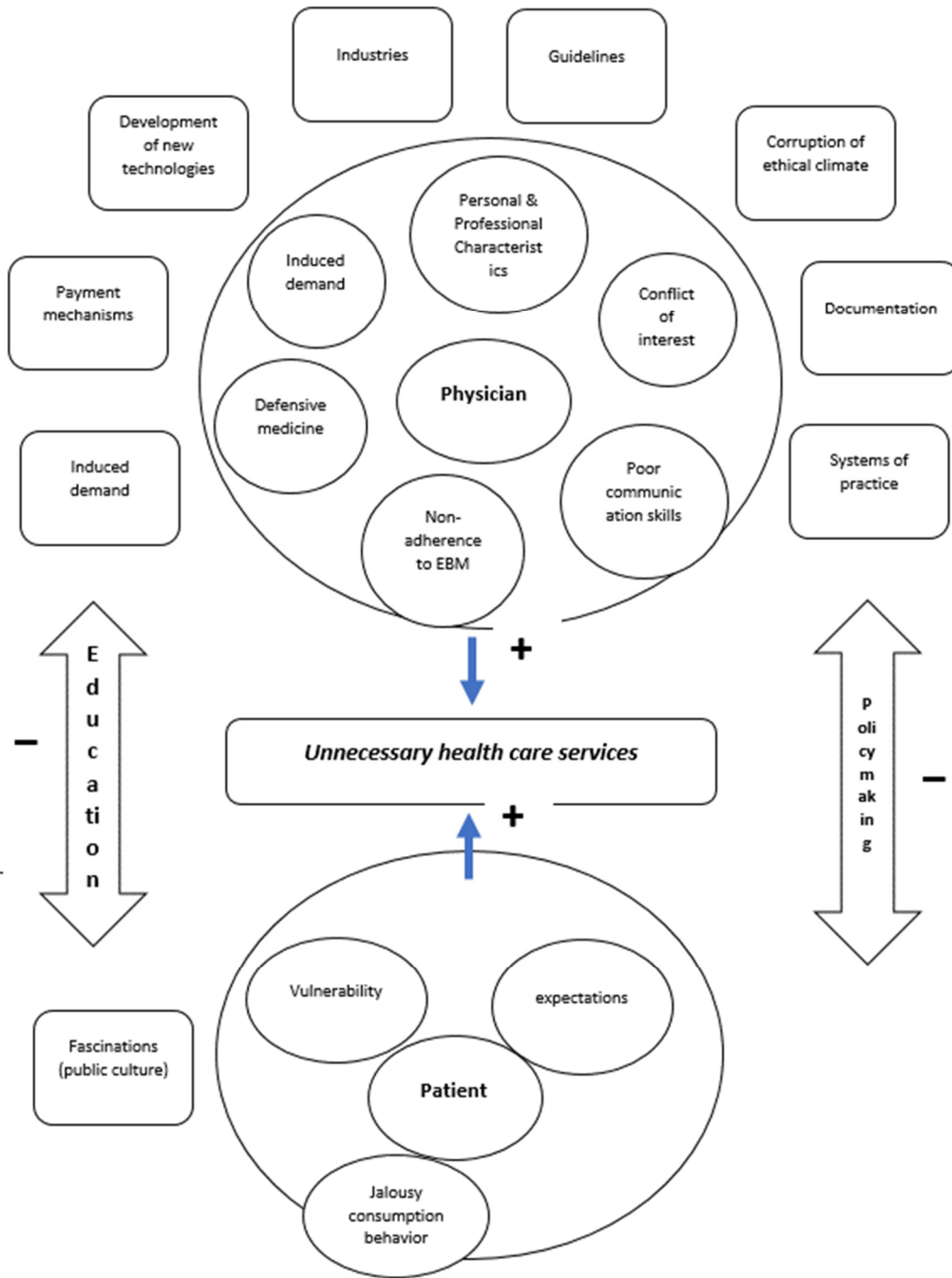


Figure 3. The concept map of the etiologic pattern of the unnecessary healthcare services and our recommendation. EBM, evidence-based medicine.

include uncertainty (the intrinsic element obtained by the physician) as a cross-cutting theme that promotes low-value treatment. They also advise managing uncertainty as a major technique to reduce low-value care (59).

Financial conflict of interests as an intrinsic factor, whether in the form of self-referral, kick-back, fee-splitting, industry payment, receipt of meals, et cetera, affects physicians' practical behavior. Studies show an association between industry payment and prescriptions of specific drugs (an extrinsic factor derived by the provid-

er), including opioids, cardiovascular drugs, and long-acting insulin, regardless of their costs (60, 61).

While our findings show that the availability and accessibility of new technologies can cause overuse (32, 34, 36, 43), some argue that using diagnostic technologies with high specificity can prevent overtreatment (62). From another point of view, using high-technology diagnostic tools can cause aging (63, 64); likewise, aging and increased morbidity in the population can lead to overuse (32).

The patient's insurance coverage is considered to have controversial effects as an extrinsic factor. Generally, it is assumed that patients' insurance may increase their tendency to receive more healthcare services at a lower price; when the benefits of more healthcare services do not outweigh the costs, its negative consequences on healthcare may present (65). On the other side, some consider insurance as a patient's support for having effective healthcare services; however, the discrimination between the 2 needs to be better-clarified (66). According to Oakes and Radomski, who highlighted the fee-for-service model as a pervasive incentive for physicians to offer more care than is necessary, thinking of the payment mechanisms of the health systems as an extrinsic driving element is consistent with their viewpoints. (67).

Documentation of health records is the other extrinsic driver of unnecessary healthcare services. Difficulty in accessing patients' health records and documentation may necessitate unnecessary services (20, 44), while the insurance companies propagate the situation by increased demands for documentation.

Once the unnecessary healthcare services and their drivers are identified, it helps identify potential modifications to change the current situation. Most importantly, we should clarify the underlying factors in detail to make targeted alterations and modifications. To approach and solve the problem, physicians and public direct engagements are recommended. Promoting dialogue between physicians and patients about unnecessary healthcare services and the possible expected harms and insisting on better care based on its quality and safety, rather than costs would be effective. Internalizing and potentiating professionalism, especially in its modern form, is crucial (68). Further, aiming at a controlled decision-making process and cognitive processes according to evidence-based medicine and professional commitments could greatly help.

Furthermore, as shown in the concept map (Figure 3), physicians' and patients' education and awareness of the issue is a fundamental necessity. Teaching professionalism and potentiating evidence-based medicine could increase their sensitivity and have a preventive effect. Informing healthcare providers about the negative consequences of their practical behavior could be beneficial. Attention towards modifying infrastructures and policies may promote the final favorable results.

There are some limitations to be mentioned. This is the first meta-synthesis performed on unnecessary healthcare services; we hope to provide a broad view of the specific issue and its drivers. Due to the lack of consistent terminology and the existence of a wide range of heterogeneous terms used interchangeably to show unnecessary healthcare services, finding articles was difficult. The studies whose full texts were unavailable were excluded from the meta-synthesis, including conference abstracts. However, despite the possibility of missing relevant articles, we achieved data saturation. In addition, there is the possibility of missing the terms that are rare; this strategy may have limited our search. Accordingly, this search strategy may result in an under-representation of the other

reasons for providing unnecessary healthcare services. Therefore, to have a broader view of the issue, different study designs, including semi-structured interviews or surveys are highly recommended. The quality appraisal of the extracted articles was not strictly performed. In addition, this study did not attempt to quantify the scale of the underlying reasons for unnecessary healthcare services that need extensive hard work beyond the scope of this meta-synthesis. It should be noted that there is a potential overlap between intrinsic and extrinsic factors affecting the main issue while not distinguishable. Furthermore, an element on one side may play a less important role on the other side.

Conclusion

This meta-synthesis provides a more accurate insight into the definition and the underlying drivers of unnecessary healthcare services. This first meta-synthesis defined unnecessary healthcare services as “overproviding healthcare services, including diagnostic services (testing and imaging) and pharmacologic treatments that could be harmful, low-value, insufficient and inappropriate.” Regarding the multifactorial nature of unnecessary healthcare services, including intrinsic and extrinsic providers, and patient-driven factors, this synthesis draws the problem as a complex and multidimensional issue in health systems. Considering this, a multilevel approach toward effective management and prevention of unnecessary healthcare services is applicable. The multilevel approach consists of modifying the intrinsic factors by education to increase physicians' knowledge and awareness as well as patients' health literacy. The extrinsic drivers need policy-making and a holistic approach by governments to overcome the issue.

Authors Contributions

The idea was generated by B.L. and further developed by P.S. and E.S. Z.D. performed a literature search, article selection, and content analysis, all double-checked by B.L., P.S., and E.S. P.S. manually performed the content analysis. The synthesis and generations was done by Z.D. and P.S. and confirmed by B.L. and E.S. The manuscript was first drafted by Z.D. and majorly revised and completed by P.S. B.L. and E.S. revised the manuscript and approved the final version.

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Data Availability

The datasets generated or analyzed during the current study are not publicly available due to copyright but will be available upon reasonable request.

Conflict of Interests

The authors declare that they have no competing interests.

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