

Evaluation of the attitudes of specialist and family physicians regarding rational drug selection

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ABSTRACT

OBJECTIVE: Physicians' personal (P) drugs, which were ranked by priority, may show variations even for the same indication. We aimed to evaluate physicians' knowledge and attitudes regarding P-drug list preparation with respect to the rational use of medicine context.

METHODS: A total of 1062 family physicians (FPs) and 562 specialist physicians (SPs) were interviewed and questioned about their knowledge and attitude regarding P-drug list preparation.

RESULTS: Compared with SPs (64.9%), significantly more number of FPs (72.8%) prepared a P-drug list. Women were more likely to prepare the P-drug list in both groups; gender comparison showed that significantly more number of female FPs (75.9%) exhibited this attitude than female SPs (67.8%) ($p=0.002$). Among SPs, the trend for P-drug list preparation attitude decreased with increasing age ($p=0.006$), and significantly less number of senior physicians showed this attitude compared with junior physicians ($p=0.007$). The most common source of information referred to by FPs (78.9%) and SPs (74.3%) during P-drug list preparation was "pharmaceutical company activities." More than 80% of responders (80.9% of FPs and 83.6% of SPs) specified that a difference "exists" or "partially exists" between original and generic drugs. Approximately one in 10 physicians in both groups stated that they "rarely/never" consider their patients' "liver/kidney disease" during prescribing.

CONCLUSION: More prominently in male and senior physicians, the attitude of P-drug list preparation remained lower than expected. Moreover, it is remarkable that pharmaceutical company promotions are the most common source of information for drug selection. These findings disclose the need for the rational use of medicine dissemination interventions for all physicians focusing on more effective use of P-drug list.

Keywords: Family physician; personal drug list; rational use of medicine; specialist physician.

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Prescribing, with its multivariable nature, is a medical practice compelling physicians in an incremental way. For this, the rational use of medicine (RUM) concept, as described by World Health Organization, helps physicians overcome difficulties in their pharmacotherapy practices [1]. Any practice apart from RUM

principles constitutes irrational use of medicines (IUM), which may ultimately cause increased workload and financial loss. Though these issues have many addressees, physicians play the key role in resolving IUM. The primary expectation from physicians regarding RUM is a well-structured drug selection, where physicians and



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medical students were shown to utilize alternative techniques and sources of information and encounter various difficulties [1–4].

Before meeting patients, a preliminary preparation guide for common indications helps the physicians in drug selection at the time of prescription regarding RUM. Using the “efficacy, safety, suitability, and cost” criteria, physicians can select their personal (P)-treatment and P-drugs, which they consider as the most appropriate in comparison to their alternatives for the diseases they manage [2–4]. P-drugs are defined as the top-ranking drugs in the P-drug list (PDL), wherein physicians categorize and prioritize drugs by indications. P-drugs may show variations among physicians even for the same indication [2–5]. Moreover, if P-drug selection is practiced by “informal” ways, these variations may become so diversified that they complicate rational pharmacotherapy. Although numerous studies have reported about the consequences of physicians’ prescribing behaviors, data regarding drug selection reflecting the background of such behaviors remains insufficient. Indeed, an unmet need in this area is evident by the lack of comprehensive studies, even though a quarter century has passed since the introduction of PDL concept.

This study aimed to evaluate the knowledge and attitudes of family physicians (FP) and specialist physicians (SP) about PDL preparation in terms of RUM and to compare these findings within and between these groups stratified by their general and occupational characteristics that may influence their RUM approaches.

MATERIALS AND METHODS

This descriptive study was performed in 12 provinces of Turkey with 1624 physicians [1062 FPs (65.4%) and 562 SPs (34.6%)]. The survey was conducted through face-to-face interviews with the physicians. The knowledge, attitude, and experiences of FPs and SPs working in randomly selected family health centers and state hospitals, respectively (both in rural and urban areas) were identified in terms of RUM (response rates: 97.2% and 74.8%, respectively).

The survey began with the questions about demographic and occupational characteristics followed by questions about physicians’ knowledge, attitudes, and experiences reflecting RUM. These data were also compared with some demographic and occupational characteristics of FPs and SPs.

Data were collected after preparations and interviewer training was completed. Data were analyzed using Microsoft Excel and SPSS 11.5 Statistics Pack software. Chi-square test was used for detection of any association between data of FPs and SPs. An overall 5% type I error level was used to infer statistical significance.

This study was approved by the Ministry of Health (MoH). Approval by ethics committee was not required for this questionnaire study.

RESULTS

Male physicians constituted 70.7% of the study population, and the number of female physicians was lesser than that of male physicians for both FPs (31.1%) and SPs (25.8%). The majority of FPs and SPs belonged to the 36–45-years-old group (57.6% and 40.0%, respectively), followed by the “≤35-years-old group” (28.7% and 33.0%, respectively) and the “>45-years-old group” (13.7% and 27.0%, respectively). The majority of FPs (69.0%) and SPs (74.4%) reported the duration elapsed after graduation as “>10 years.”

The majority of FPs (72.8%) and SPs (64.9%) declared that “they prepare PDL for common diseases,” which was significantly higher in FPs than in SPs ($p=0.001$).

PDL preparation attitude was compared within FP and SP groups and with each other stratified by some of their characteristics. In both groups, the number of female physicians preparing PDL was higher; FPs exhibited a significantly more positive attitude than SPs (75.9% and 67.8%, respectively) ($p=0.002$). However, the intragroup comparisons of FPs and SPs did not show a statistical difference by gender ($p>0.05$), (Table 1).

In terms of age stratum, the percentage of FPs preparing PDL was higher than that of SPs in all age groups ($p<0.001$). Although it was not different by the age groups within FPs, this attitude exhibited a significant decreasing trend in SPs as their age increased ($p=0.006$) (Table 1).

PDL preparation attitude also significantly differed between the groups with respect to physicians’ working duration ($p<0.001$). Intragroup comparisons revealed this attitude to be significantly different in only SPs; the percentage of senior SPs preparing PDL was lower than that of junior SPs ($p=0.007$) (Table 1).

SPs were stratified and compared by their places of residency and specialties in terms of PDL preparation for commonly encountered diseases, and no statistically significant difference was detected in either comparison (Table 2).

TABLE 1. Comparisons of physicians' personal drug list preparation attitudes for commonly encountered diseases using their demographic and occupational characteristics

Stratum	Personal drug list preparation for commonly encountered diseases				P	
	Family physician		Specialist physician			
	Yes	No	Yes	No		
Gender						
Male	n	519	208	263	149	0.002
	%	71.4	28.6	63.8	36.2	
Female	n	246	78	97	46	
	%	75.9	24.1	67.8	32.2	
P		0.147		0.447		
Age (years)						
≤35	n	225	76	130	52	<0.001
	%	74.8	25.2	71.4	28.6	
36-45	n	430	174	147	75	
	%	71.2	28.8	66.2	33.8	
>45	n	110	36	83	68	
	%	75.3	24.7	55.0	45.0	
P		0.398		0.006		
Working duration (years)						
Junior (≤10 years)	n	312	99	260	119	<0.001
	%	75.9	24.1	68.6	31.4	
Senior (>10 years)	n	453	187	100	76	
	%	70.8	29.2	56.8	43.2	
p		0.075		0.007		

TABLE 2. Comparison of specialist physicians regarding PDL preparation attitude based on their places of residency and specialty

	Place of residency training				Specialty			
	University Hospital		Training and Research Hospital		Surgical Sciences		Internal Sciences	
Personal drug list preparation attitude for commonly encountered diseases	n	%	n	%	n	%	n	%
Yes	199	64.2	159	65.4	127	67.2	221	62.8
No	111	35.8	84	34.6	62	32.8	131	37.2
P	0.762				0.307			

FPs and SPs stated that the most common source of information that they referred to for selecting drugs during PDL preparation was “pharmaceutical company (PC) activities” (78.9% and 74.3%, respectively), fol-

lowed by “treatment guidelines” (74.4% and 69.3%, respectively) (Table 3).

The most considered criterion for drug selection during PDL preparation was “efficacy” for both FPs (97.4%)

and SPs (97.3%), followed by “safety, personal experience, cost, and suitability” for FPs and “personal experience, safety, suitability, and cost” for SPs. One-fifth of both groups included “PC promotions and patients’ demands” among the criteria they considered in drug selection (Table 3).

When the participants were questioned about the drug-related factors they regarded as necessary to consider during prescribing, FPs prioritized them as “safety, efficacy, and suitability” and SPs as “efficacy, safety, and suitability.” The majority of physicians in both groups stated that they considered that the drug they pre-

scribed should not be generic (64.9% and 67.0%, respectively). When participants were queried about “any existence of difference between original and generic drugs,” 80.9% of FPs and 83.6% of SPs stated that a difference “exists” or “partially exists.” Even few number of physicians did not have such knowledge (2.6% and 3.1%, respectively), (Table 3).

In terms of medical history data used during prescribing, more than three-fourth of both FPs and SPs declared that the information they “always” used was “age and pregnancy/lactation.” About one in 10 physicians in both groups stated that they “rarely/never” consider

TABLE 3. The approaches of the physicians for the selection of drugs they prescribed (*multiple choices allowed)

Parameters	Family Physician		Specialist Physician	
	n	%	n	%
Sources of information consulted during drug selection*				
Pharmaceutical company activities	663	78.9	300	74.3
Treatment guidelines	625	74.4	280	69.3
Vademecum	227	27.0	118	29.2
National drug formulary	196	23.3	102	25.2
Colleague experiences	214	25.5	82	20.3
Criteria considered for drug selection during personal drug list preparation*				
Efficacy	1029	97.4	543	97.3
Safety	886	83.9	430	77.1
Personal experience	880	83.3	474	84.9
Cost	795	75.3	373	66.8
Suitability	739	70.0	386	69.2
Pharmaceutical company promotions	234	22.2	129	23.1
Patients’ requests	227	21.5	107	19.2
Drug-related factors regarded as necessary during prescribing*				
Efficacy	1041	98.6	544	98.7
Safety	1046	98.9	542	98.2
Suitability	1031	97.4	527	95.6
Suitability of pharmaceutical form	1003	94.8	514	93.3
High bioavailability	938	88.7	478	86.8
Cost	895	84.6	444	80.6
Broad indication	760	71.8	382	69.2
Being a non-generic drug	687	64.9	369	67.0
Being known and commonly used drug	567	53.6	304	55.2
Is there any difference between original and generic drugs in terms of efficacy?				
Yes	245	23.3	152	27.4
Yes, in some drugs	607	57.6	312	56.2
No	174	16.5	74	13.3
I don’t know	27	2.6	17	3.1
Total	100.0		100.0	

“liver/kidney disease” of their patients during prescribing. The percentage of FPs and SPs who “rarely/never” conceived their patients’ “social insurance” was 20.1% and 34.8%, respectively. The participants declaring to “rarely/never” use “affordability” information during prescribing constituted 14.0% of FPs and 31.9% of SPs (Table 4).

DISCUSSION

Drug selection is one of the most critical steps of RUM practices. Provided that physicians prepare their own personal formularies before encountering their patients, the care they will provide could be more successful. A

personal formulary prepared by PDL in accordance with RUM confers significant advantages to physicians, e.g., prescribing in line with indication and individual characteristics of the patient or utilizing solid criteria and sparing time for drug selection [2–5]. This study showed that despite being partially better than the literature, the physicians were worse than expected in PDL preparation, an important component of RUM, with some differences based on their demographic and occupational characteristics.

Our study revealed that FPs (72.4%) were significantly more likely to prepare PDL than SPs (64.9%). No data directly comparing these groups were present in the

TABLE 4. Frequency of utilization of anamnesis data while prescribing, stratified by physician groups (multiple choices allowed)

Patients' Information	Family Physician				Specialist Physician			
	Always	Frequently	Rarely	Never	Always	Frequently	Rarely	Never
Age								
n	881	151	14	0	434	98	13	8
%	84.2	14.4	1.4	0	78.5	17.7	2.4	1.4
Gender								
n	507	356	158	19	249	132	118	52
%	48.8	34.2	15.2	1.8	45.2	24.0	21.4	9.4
Concomitant drugs								
n	572	439	34	1	282	221	37	12
%	54.6	42.0	3.3	0.1	51.1	40.0	6.7	2.2
Drug allergy								
n	704	282	56	7	360	141	41	5
%	67.1	26.9	5.3	0.7	65.8	25.8	7.5	0.9
Liver disease								
n	479	447	114	3	312	176	53	8
%	45.9	42.9	10.9	0.3	56.7	32.1	9.7	1.5
Kidney disease								
n	481	451	98	4	313	166	57	12
%	46.5	43.6	9.5	0.4	57.1	30.3	10.4	2.2
Other chronic conditions								
n	498	476	57	2	290	185	60	12
%	48.2	46.1	5.5	0.2	53.0	33.8	11.0	2.2
Pregnancy and lactation								
n	869	158	9	4	429	87	14	20
%	83.6	15.1	0.9	0.4	78.0	15.8	2.5	3.7
Social insurance								
n	393	436	171	38	150	208	122	69
%	37.9	42.0	16.5	3.6	27.3	37.9	22.2	12.6
Affordability								
n	415	471	118	27	163	213	123	53
%	40.3	45.7	11.4	2.6	29.5	38.6	22.3	9.6

literature. A study performed with resident physicians and SPs in a tertiary center of Turkey in 2012 reported that 59% of participants prepared PDL [6]. This approach was exhibited by 20% of resident physicians and SPs as reported by an Indian study [7]. A study performed in Australia reported that general practitioners used personal formularies for certain drug groups, e.g., 70% had personal formulary for nonsteroidal anti-inflammatory drugs [8]. We propose that the physicians in our study are better in PDL preparation than those in the literature.

The lower percentage of PDL preparation attitude in compared to FPs, a consistent finding in all age groups, is among striking aspects of this study. It is assumed that the number of diseases managed by SPs within their branch is lesser than that managed by FPs. Although this may imply that SPs prepare PDL more easily, the opposite was observed in our study, which may be linked to the diversity of the diseases covered. Unlike FPs who are responsible for managing many conditions, SPs may skip the practical benefits of PDL preparation due to the limited spectrum of indications. Toward the 2000s, awareness regarding PDL preparation in accordance with RUM officially started to spread [1, 4, 5]. Some SPs might have received their specialty training before this critical time-point. It is assumed that SPs are older than FPs due to the time required for their specialty training. Considering that the percentage of the ">45-year-old group" among SPs (27.0%) doubles that in FPs (13.7%), relative elderliness of SPs may account for one of the reasons for their lower capability in terms of PDL preparation. This association is supported by relevant data comparing the age groups and occupational experiences of the physicians.

In our study, SPs exhibited a decreasing trend for PDL preparation with increasing age. In parallel, this attitude was less adopted among senior SPs than among junior SPs. In two Indian studies assessing PDL preparation attitudes, older and senior physicians were reported to practice less PDL preparation than their younger and inexperienced counterparts, respectively [7, 9]. These findings, consistent with our results, might be explained by the recent increase in RUM training courses for physicians [3–5, 10].

Female physicians showed more PDL preparation attitudes in both groups. Although no generalization exists, some evidence suggests that women have a more positive attitude than men in various medical practices [7, 11, 12]. For instance, a Swedish study concluded that female practitioners appreciated information from public authorities more than their male colleagues and that male

practitioners had a more affirmative approach toward the industry-based data [11]. In another study, female physicians were reported to practice more RUM than males, without gender difference in P-drug selection [7].

Physicians acquire some of the drug information via PC activities. It is unfavorable that physicians frequently and unrestrainedly use this industry-based information with questionable objectivity and biased presentation [2, 13]. The fact that the most common source of information referred by FPs and SPs during PDL preparation was PC activities is challenging. Two Indian studies addressing the same issues reported that physicians most frequently benefited from "PC activities" during drug selection [7, 9]. In another study performed in Cyprus and Greece, the frequency of using "PC representatives" for prescribing were at second and fourth rank, respectively [14]. In previous studies performed in Turkey, benefiting from "PC activities" during selecting or prescribing drugs varied between 14%–34%, where none of which was at first rank (ranging third–seventh), [15–17, 6, 18]. Although less favorable than those published in Turkey, our findings either overlap or show some similarities with those in other countries. This discloses the heavy influence of the drug companies on the physicians in drug selection and indicates the necessity of a more careful evaluation by the physicians for using this potentially biased and questionable source.

Physicians are expected to prepare PDL using the "efficacy, safety, suitability, and cost" criteria according to evidence-based objective findings during RUM-compliant drug selection [2]. The physicians in our study appeared to prioritize "efficacy" in drug selection, which was consistent with the literature [14, 15]. In contrast, they seemed to undervalue drug selection criteria other than efficacy, as evidenced by insufficient recognition of suitability by one-third of physicians. While physicians' preference toward efficacy is a positive approach, other drug selection criteria should not be ignored according to the RUM principles.

By asking specific questions to the patient, a physician who prepares PDL determines the suitability of the drugs that she/he included to the list for that indication [2]. Therefore, beside "drug selection" criteria, "drug-related factors regarded as necessary during prescribing" were also questioned to evaluate this attitude. While "efficacy, safety, and suitability" were again ranked among top factors, around seven out of 10 physicians in both groups regarded "broad indication" as necessary. Despite appearing to be advantageous in terms of "efficacy" at first

sight, it may be undesirable for certain therapies like antibiotics, where “broad-spectrum” preference might not necessarily be rational [19].

In our study, >80% of physicians in both groups stated that “original and generic drugs differ or partially differ in terms of efficacy.” A Saudi Arabian study conducted in 2007 reported that 67% of physicians thought that generic drugs were equal to original drugs in terms of efficacy [20]. In a US study, 67% of physicians were reported to “partially or strongly” agree that generic drugs were as efficacious as the originals [21]. In a Turkish study, 55% of physicians stated that there were differences between some generic and original drugs [22]. Generic drugs prove themselves as therapeutically equivalent to the original drugs whose efficacy and safety were determined through rigorous assessments. A retrospective analysis of 2,070 bioequivalence studies approved by FDA showed that original and generic drugs only had a mean of 3.56% bioavailability difference [23]. Both our study and the literature showed high prevalence of the misbelief about efficacy difference, which addresses the lack of knowledge of physicians and warrants the need for informative and awareness-oriented interventions.

History taking provides important clues to physician during prescribing, thus requiring all relevant patient data to be used sufficiently. Prescribing a drug within PDL without using past medical history predisposes to adverse effects. About 10% of our participants in both groups declared that they “rarely/never” considered “liver/kidney disease” status of their patients while prescribing. Previous studies in Turkey showed that during prescribing, 11%–49% of physicians did not ask for the presence of liver disease [15, 16, 6] and 12%–42% did not question the presence of kidney disease [15, 6, 16]. While these conditions should be routinely considered during writing a prescription, they need more attention in special situations such as older age, where hepatic bio-transformation and renal function diminish [24]. A US study performed in a tertiary healthcare center reported that the leading cause of clinically relevant medication errors were decreased kidney and liver functions [25]. In a Dutch study performed with around 30,000 primary care patients, 15% of those with eGFR \leq 40 were detected to have medication errors, most of which were classified as significant or potentially serious adverse drug events [26]. When making treatment decisions, physicians are definitely expected to consider such critical organ impairments, which may increase the likelihood of occurrence of serious adverse events and negatively influence therapeutic outcomes. A substantial number of

physicians in our study ignored the liver or kidney status during prescribing, which is an example for IUM and reflects the need for improvement.

Though history taking deems essential for “suitability” criterial “cost” is also adversely affected by the lack of this information. In our study, up to one-fifth of FPs and one-third of SPs appeared to “rarely/never” use “social insurance” and “affordability” data of their patients during prescribing. Previous studies in Turkey showed great variations in terms of questioning “social insurance” and “affordability” by the physicians [6, 15, 16]. A US primary care study reported 68% of physicians to show regard to cost of the drug even in Medicare patients [27]. Regarding RUM, physicians should consider the cost of the drug during prescribing for all patients regardless of social insurance. Consideration of treatment cost is not only essential for sustainable and high-quality healthcare service but also for access of drugs to those affording the treatment by themselves. In fact, a US study reported that two-thirds of patients who found prescribed drugs expensive did not tell their physicians that they would underuse those drugs [28]. Educational and informative interventions regarding drug costs were reported to make physicians to pay more attention to cost issues during prescribing, regardless of the social insurance status of their patients [29]. The fact that physicians in our study considered “cost” lower than expected warrants the need for educational activities regarding this issue.

Our study has some limitations. The survey applied to SPs did not contain PDL questions specific to each specialty. Albeit weakly, there is possibility that some detailed characteristics of FPs and SPs and their institutions other than those questioned in the survey might influence their responses.

CONCLUSION

In conclusion, our findings suggest that PDL preparation is somewhat lower than expected, where women and younger physicians prove to be more successful than male and older physicians who practiced less PDL, respectively. It is remarkable that physicians considered efficacy at most during PDL preparation and prescribing, although they insufficiently used patient’s history, regard PC promotions as the most referred source of information, and have lack of knowledge about generic drugs. These approaches regarding PDL appear to be influenced by some of their demographic characteristics or being an FP or SP. The importance of using PDL has become more conspicuous nowadays, since the number

and knowledge of drug is continuously expanding every day and IUM hurdles are mounting gradually. Benefiting from the significant findings of the study contributes to more effective use of PDL during planning the treatment and hence dissemination of RUM.

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