

## Opinions and Knowledge Levels of Physicians Providing Primary Health Care on Precision Medicine Applications

### Birinci Basamak Sağlık Hizmeti Sunan Hekimlerin Hassas Tıp Uygulamaları Konusundaki Düşünceleri ve Bilgi Düzeyleri

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#### ABSTRACT

**Objective:** This study aims to determine the awareness, attitudes, expectations and concerns of primary care physicians about precision medicine.

**Materials and Methods:** This descriptive-qualitative study was conducted with family physicians providing primary health care between January 2023 and April 2023. Data were collected through face-to-face, in-depth interviews using a semi-structured interview form. The interviews were recorded and transcribed with a voice recorder.

**Results:** This study was conducted with 27 (12 male, 15 female) family physicians. The views of the participants on their previous knowledge on precision medicine are given in Table 2. It was determined that 74.1% of the participants did not have detailed information about precision medicine before.

**Conclusions:** In order to eliminate disadvantageous aspects such as social discrimination and financial burden in precision medicine practice, the studies can be examined by the managers by taking the opinions of health professionals.

**Keywords:** Community health, family physician, precision medicine

#### ÖZ

**Amaç:** Bu çalışmanın amacı, birinci basamakta hizmet sunan hekimlerin hassas tıp konusundaki farkındalığı, tutumları, beklentileri ve endişelerini saptamaktır.

**Materyal ve Metot:** Tanımlayıcı-nitel tasarıma sahip bu çalışma, birinci basamak sağlık hizmeti sunan aile hekimleri ile Ocak 2023-Nisan 2023 tarihleri arasında yürütülmüştür. Veriler, yarı-yapılandırılmış görüşme formu kullanılarak, yüz-yüze derinlemesine görüşmelerle toplanmıştır. Görüşmeler, ses kayıt cihazıyla kaydedilmiş ve transkript edilmiştir. Verilerin değerlendirilmesinde betimsel analiz yöntemi kullanılmıştır.

**Bulgular:** Bu araştırma 27 (12 erkek, 15 kadın) aile hekimi ile yürütülmüştür. Katılımcıların hassas tıp konusunda daha önceki bilgilerine dair görüşleri tablo 2’de verilmiştir. Katılımcıların %74,1’inin daha önce hassas tıp konusunda detaylı bilgilerinin olmadığı tespit edilmiştir.

**Sonuç:** hassas tıp uygulamalarında toplumsal ayrımcılık, maddi külfet gibi dezavantajlı yönlerin giderilebilmesi için sağlık profesyonellerinin görüşleri alınarak çalışmalar yöneticiler tarafından incelenebilir.

**Anahtar Kelimeler:** Aile hekimi, hassas tıp, toplum sağlığı

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## INTRODUCTION

The concept of precision medicine, also called individualized or personalized medicine, has recently attracted attention in scientific, medical and public areas and has become the next model of health care delivery.<sup>1</sup> Because each individual has unique qualities and characteristics in the scientific and social context. Therefore, precision medicine states that it is not correct to apply the same treatment method to 10 people suffering from the same disease.<sup>2</sup> While the concepts of personalized medicine and precision medicine are very similar, precision medicine also encompasses a multidisciplinary data-driven approach to foster better clinical decision-making through a clear understanding of the molecular basis of an individual's disease.<sup>3,4</sup> Factors affecting the launch of the Precision Medicine Initiative are as follows: the dramatic fall in the cost of DNA sequencing and the increase in business driven by the delivery of healthcare as a continuous and rich source of personal data, the adoption of electronic medical records (EMRs), and the growth of digital.<sup>5-7</sup> Physicians are the people who are in contact with patients and will carry out sensitive medicine applications.<sup>8</sup> Although precision medicine is a new perspective, its importance is increasing, and it has started to be used all over the world. It is important to determine the perception of the physicians in our country about precision medicine and the perception of the patients about precision medicine in terms of forming a cohort.

Since the views and understanding of precision medicine among health professionals can play an important role in this process, investigating awareness, attitudes and perspectives on precision medicine in Türkiye with a mixed-method study will guide the steps to be taken in the future. This study was conducted with the aim of determining the awareness, attitudes, expectations and concerns of primary care physicians about precision medicine.

## MATERIALS AND METHODS

**Ethics Committee Approval:** Our study was approved by the Ankara Medipol University Non-Interventional Clinical Research Ethics Committee (Date: 09.05.2023, decision no: 50). The study was carried out by the Helsinki Declaration.

**Study Setting and Recruitment:** A qualitative research method was used in this study. Qualitative research helps to present and interpret social structures and processes by trying to reveal the perceptions and experiences of the participants, to understand situations and events from their perspective, and to interpret their experiences.<sup>9,10</sup> Interpretation of the data was carried out in 4 stages (coding, ranking, generating themes, ensuring validity and reliability).

**Preparation of the Interview Form:** A semi-structured interview form was used in the research. The interview form was prepared with reference to the relevant literature and scientific studies, and in this context, 5 questions were developed to be used in the research.

**Data Collection Tool:** The face-to-face interviews with the participant's family physicians were recorded by voice recording or note-taking with the permission of the participants. Then, the audio recordings were deciphered and converted into text. The 10-question personal information form was created by the researchers in order to define some socio-demographic characteristics of the family physicians participating in the study. This form consisted of questions about sociodemographic characteristics (age, gender, work experience, etc.).

**Statistics:** Content analysis was used in the analysis of the data collected using the interview technique; data were analyzed in four stages, as stated by Yıldırım and Şimşek.<sup>9</sup> First, the data were coded, and then the themes-categories of the coded data were determined. Subsequently, codes and themes were organized, and the final findings were defined and interpreted. During the coding phase of the opinions of the participants, the consistency was checked by ensuring that the opinions were coded by both researchers. In qualitative studies, the agreement between expert evaluation and researcher categorization is expected to be 90% or more.<sup>11</sup>

## RESULTS

For the questions within the scope of each sub-problem, categories and codes were created within the framework of the relevant literature and participant opinions, participant opinions were deciphered for each category and code, the findings were presented in tables, and participant views were included with direct quotations. The findings were interpreted and discussed within the framework of the related literature.

Demographic information of the participants is given in Table 1. It was determined that 44.4% of the participants were between the ages of 28-35, 55.6% were women, and 37% had professional experience in the range of 10-15 years.

The views of the participants on their previous knowledge on precision medicine are given in Table 2. It was determined that 74.1% of the participants did not have detailed knowledge about precision medicine before (Table 2).

**Table 1.** Demographic information of the participants.

Demographic information	n (%)	
Age	28-35	12 (44.4)
	35-45	9 (33.3)
	45 and older	6 (22.2)
Gender	Male	12 (44.4)
	Female	15 (55.6)
Professional experience	0-5 years	4 (14.8)
	5-10 years	7 (25.9)
	10-15 years	10 (37.0)
	15 years and more	6 (22.2)

n: number, % frequency.

**Table 2.** General knowledge of participants on precision medicine.

Patients' knowledge level	n (%)	
Have you heard/do you know the concept of precision medicine?	I've never heard	2 (3.7)
	I've heard of it, but I don't know for sure	5 (18.5)
	I know, but I don't have much detailed information	20 (74.1)
How important do you think precision medicine is in the prevention and treatment of diseases?	Very important	2 (7.4)
	Important	15 (55.6)
	No idea	10 (37.0)
Do you think the data obtained during precision medicine practice can create ethical (moral) problems?	Yes	20 (74.1)
	No	7 (25.9)

While 51.65% of the participants stated that precision medicine is highly effective in personalized clinical care, 33.33% stated that precision medicine is promising enough in therapeutic areas such as oncology. In general, the opinions of the participants that precision medicine can be used in health risk estimation, in the management of chronic diseases, in studies of prolonging life expectancy and in accelerating genetic studies came to the fore (table 3). However, the majority of the participants (n=16) clearly stated that they did not consider their level of knowledge on precision medicine adequate. In this respect, while K1's view was "Precision medicine is a health service delivery that can reveal a more spe-

cific and effective approach to treatment, estimation of patient health risks and management of chronic diseases, but I do not think my knowledge is sufficient".

Opinions on the benefits and negative aspects of precision medicine are summarized in Table 4. Participants stated that precision medicine can be beneficial, especially in the subjects of 'prediction of diseases (n=7) and rational drug use (n=7)." In summary, the participants listed in Table 4 summarized the positive aspects of precision medicine as follows; "Precision medicine helps treat diseases more specifically and effectively, better predict health risks, and prevent disease.

**Table 3.** General information about precision medicine and opinions on the adequacy of the information.

Category	Code	Participant	n
General Health	Health Risk Estimation	K1, K5, K8, K15	4
	Prolongation of life expectancy	K11, K13, K14	3
Disease management	The acceleration of genetic studies	K25, K26	2
	Chronic disease management	K2, K8, K10	3
Knowledge level	Lack of knowledge level	K27, K26, K24, K23, K21, K19, K18, K17, K16, K14, K12, K7, K2, K5, K4, K1	16

**Table 4.** Opinions on the positive and negative aspects of precision medicine.

Category	Code	Participant	n
Positive aspects	Disease prediction	K1, K5, K8, K15, K19, K26, K27	7
	Using medicine with care	K2, K8, K13, K17, K9, K11, K17	7
	Reduction in health expenditures	K12, K15, K21, K24,	4
	Increasing personal interventions	K5, K19, K11, K27	4
	Increasing life expectancy	K26, K20, K6, K3	4
Negative aspects	Inequality between individuals	K1, K4, K8, K9, K10, K13, K16, K22, K25	9
	Data security issues	K25, K23, K16, K12, K8, K5, K3, K9, K7	9
	Additional cost	K25, K17, K12, K9, K8, K5, K4, K2	8
	Ethical issues	K8, K10, K19, K7, K24, K18	6
	New genetic problems	K27, K22, K11, K5	4

Opinions on the relationship of precision medicine with genetic research and genetic treatments and the social reflections of genetic results were grouped under 3 categories as follows: 1. Genetic treatments will greatly improve public health (n=12) 2. There may be problems in reaching everyone (n=7), and 3. It may cause social discrimination (n=5). Opinions about the confidentiality/reliability of precision medicine and its position within the framework of ethical principles were summarized as "concerns about the protection of ethical principles (n=9)" and

concerns about the protection of personal data (n=15)." Views on the social applicability of precision medicine and its place in the health system are given in Table 5. Participants stated that they had insufficient knowledge about the applicability of precision medicine and its place in the health system (n=12). However, although they are at an insufficient level of knowledge, the views that 'integration (n=3) ', "adaptation to social demands (n=3)", and 'supporting technological developments (n=2)" have come to the fore.

**Table 5.** Views on the social applicability of precision medicine and its place in the health system.

Category	Code	Participant	n
<b>Social applicability</b>	Integration	K4, K5, K8	3
	Adaptation to social demands	K1, K2, K6	3
	Technological development	K1, K18	2
	Accessibility for all	K5, K11, K27	3
	Sophistication	K26, K20	2
<b>Place in the healthcare system</b>	Application increments	K25, K23, K16, K12	4
	Awareness training	K2, K11, K10, K7	4
<b>Lack of knowledge level</b>	Public inadequacies	K8, K10	2
	Inability to interpret clearly	K1, K3, K9, K13, K14, K16, K17, K20, K22, K23, K26, K27	12

**DISCUSSION AND CONCLUSION**

The sequencing of the human genome has led many to speculate about the potential for short-term therapy for clinical medicine.<sup>12</sup> It was expected that understanding the genetic basis of the disease would naturally lead to better-targeted therapies. Indeed, the sharp reduction in sequencing cost following the invention of "next-generation" technologies has facilitated the discovery of many more causative genes and their application to individual patients, including several recently widely reported genome-driven samples.<sup>13-15</sup>

One of the focuses of future work is the increasing emphasis on precision medicine's ability to affect not only individuals but also populations. This has been termed "sensitive public health". Another area of emphasis should be to understand how precision medicine can increase or reduce historical disparities in access to care.<sup>16</sup> "Do historically underserved populations have access to precision medicine?" and "What policies can ensure appropriate access?" These questions will need to be addressed in the broader and more variable context of proposed revisions to health reform and Medicaid programs.<sup>17</sup> According to the results obtained in our study, while the participants reported the positive aspects of precision medicine as 'disease prediction', the widespread use of rational drugs, and the increase in personal interventions', they mentioned 'inequality between individuals' concerns as the main negative aspects. Because if precision medicine facilities are limited to only a certain group or population, this

will cause great problems in the speed and quality of other individuals' access to health.

Primary care physicians act as a bridge between the community and the health system to use precision medicine practices in patient approaches. Newly developed precision medicine techniques contribute to patient approach similar to laboratory tests and imaging methods (CT, MRI) currently widely used. The genetic profile alone cannot explain the patient's social status, lifestyle, and perspectives. Therefore, primary care physicians are important in the holistic evaluation of patients. In addition to the comprehensive patient evaluation that physicians have already made, the use of precision medicine applications will provide significant benefits for diagnosis and treatment.<sup>2</sup> Family physicians interviewed in our study stated that precision medicine can play an important role in helping individuals lead a more comfortable life, especially by increasing their quality of life. In fact, it was emphasized that the biggest role in this matter belongs to them, but first, the necessary training should be given to health professionals about precision medicine.

In conclusion, it has been determined that precision medicine is generally welcomed by family physicians and that the problems that may occur in the early stages of practice can be eliminated in the following years. It can pave the way for important developments in the direction of public health. However, in order to eliminate disadvantageous aspects such as social discrimination and financial burden in precision medicine practice, the studies can be ex-

amined by the managers by taking the opinions of health professionals. Steps can be taken gradually according to both the position of precision medicine in the health system and, the health of the community and the personal health needs of individuals. Since the views and understanding of precision medicine among health professionals can play an important role in the realization of precision medicine, investigating awareness, attitudes and perspectives on precision medicine in Türkiye through a mixed-method study will guide the steps to be taken in the future. This study had some limitations. These include the study's retrospective nature and the small size of the longitudinal cohort.

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**Conflict of Interest:** No conflict of interest was declared by the authors.

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