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# The Assessment of Knowledge Levels and Practices of Family Physicians Practicing in Family Health Centers in Ankara with Regard to Well Child Follow-up

# Ankara'daki Aile Sağlığı Merkezleri'nde Çalışan Aile Hekimlerinin Sağlam Çocuk Takibinde Bilgi Düzeylerinin ve Uygulamalarının Değerlendirilmesi

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**Abstract**
**Objectives:** The purpose of our study is to call attention to responsibilities of family physicians regarding well child follow-up, which is very important to improve and support pediatric health, to refresh family physicians' knowledge, and to emphasize the significance and vitality of well child follow-up.
**Materials and Methods:** The study was planned as an observational and cross-sectional survey study. The survey questions were prepared based on the guideline titled "Periodical Health Examinations and Screening Tests Recommended in Family Medicine Practice", which was produced by the Turkish Ministry of Health and distributed to all family physicians. All family physicians practicing in Family Health Centers (FHC) located in Ankara were sent 4 e-mails containing the link to the survey between December 1st, 2016 and February 2nd, 2017, and invited to participate in the study. Among the family physicians who agreed to participate in the study, 191 physicians who answered the section measuring their knowledge levels in full were included in the study. The overall knowledge level was calculated by scoring each correct answer as 1 point. The maximum score possible was 19 points.
**Results:** The average total score of family physicians was found to be 9.73 ± 2.94 which was relatively low. A positive, weak, and significant correlation was found between knowledge level score and total months worked in FHC. Also, a positive and significant correlation was found between frequency of reading the guideline on well child follow-up and knowledge level score. Further, it was revealed that family physicians mostly performed their daily practices related to well child follow-up. However, it was seen that some non-mandatory follow-up practices were not sufficiently performed.
**Conclusion:** This study showed that it was necessary to provide trainings for family physicians and to encourage them to use guidelines on the subject in order to ensure well child follow-up is at the desired level in primary health care to raise a healthy generation.
**Key words:** Child health, family medicine, preventive medicine, primary health care

**Öz**
**Amaç**: Çalışmamızın amacı çocuk sağlığının geliştirilmesi ve desteklenmesinde oldukça önemli bir yere sahip olan sağlam çocuk takibi konusunda aile hekimlerinin üzerine düşen sorumluluklarına dikkat çekmek, bilgilerini güncellemeyi sağlamak, sağlam çocuk takibinin önemini ve gerekliliğini vurgulamaktır.
**Materyal ve Metot:** Araştırma gözlemsel, kesitsel bir anket çalışması olarak planlandı. Anket soruları T.C. Sağlık Bakanlığı tarafından Türkiye için uygulanabilir, güncel bilimsel kanıtlar göz önüne alınarak hazırlanmış ve tüm aile hekimlerine dağıtılmış "Aile Hekimliği Uygulamasında Önerilen Periyodik Sağlık Muayeneleri ve Tarama Testleri" adlı rehberden faydalanarak hazırlandı. Ankara'daki Aile Sağlığı Merkezleri'nde (ASM) çalışan tüm aile hekimleri çalışmaya elektronik posta yoluyla anket linki üzerinden 01.12.2016-01.02.2017 tarihleri arasında toplam 4 kez davet edildi. Araştırmaya katılmayı kabul eden aile hekimlerinden anketimizin bilgi düzeylerini değerlendiren bölümünü eksiksiz dolduran 191'i çalışmaya dâhil edildi. Çalışmada toplam bilgi düzeyleri; her soruya 1 puan verilerek soruların puanlandırılması ile hesaplandı. Tüm sorulara doğru cevap verildiğinde toplam 19 puan alınıyordu.

**Bulgular:** Aile Hekimlerinin ortalama toplam puanları nispeten düşük bir puan olan 9,73 ± 2,94 olarak hesaplandı. Bilgi düzey puanları ile ASM'de toplam çalışılan ay arasında anlamlı derecede pozitif yönde zayıf korelasyon olduğu izlendi. Ayrıca sağlam çocuk takibi ile ilgili rehberin okunma sıklığı ile toplam bilgi düzey puanları arasında olumlu yönde anlamlı bir ilişki olduğu saptandı. Bununla birlikte aile hekimlerinin sağlam çocuk takibi konusundaki günlük pratik uygulamalarını çoğunlukla yaptıkları ortaya çıktı. Ancak zorunlu olmayan bazı takiplerdeki uygulamaların yeteri kadar yapılmadığı görüldü.
**Sonuç:** Bu çalışma bize sağlıklı nesiller yetiştirmek adına, birinci basamakta sağlam çocuk izleminin istenilen düzeylere çıkarılabilmesi için aile hekimlerine eğitimlerin verilmesinin ve konu hakkındaki rehberlerden yararlandırılmasının uygun olacağını gösterdi.
**Anahtar kelimeler:** Çocuk sağlığı, aile hekimliği, koruyucu hekimlik, temel sağlık hizmeti

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## Introduction

Well child follow-up has an important place among primary health care services. It is a service by which physicians monitor children's growth and development, assess their health status, and provide protective health services.[1]

The family physician has an important duty in terms of preventing diseases since primary care health services are easy to reach and serve as the first contact point.[2] In order to prevent diseases, the family physician monitors growth and development, provides guidance for age-appropriate nutrition, tracks vaccinations performed to prevent contagious diseases, and educates families to ensure healthy growth of their children.[1] Also, screening tests allow for early diagnosis of diseases, regulation of the treatment, and prevention of major health problems which may emerge in later stages of the disease.[3]

The purpose of our study is to call attention to responsibilities of family physicians regarding well child follow-up, which is very important to improve and support pediatric health, to determine knowledge levels and practices of family physicians, and to help family physicians update their knowledge, and to emphasize the significance and vitality of well child follow-up.

## Materials and Methods

The population of this cross-sectional, descriptive, and epidemiological survey study consisted of all family physicians practicing in Family Health Centers (FHC) located in the province of Ankara. The entire population (n: 1439) was reached via e-mail and no separate sampling was performed. The study was carried out between December 1st, 2016 and February 1st, 2017.

The ethics board approval for the study was obtained from the local ethic comity. The necessary approval from the Turkish Ministry of Health for the application of the survey to family physicians practicing in relevant FHCs was received.

In light of a comprehensive literature review carried out prior to the study, structured survey questions specific to the research were prepared by the researchers. Also, structured questions assessing knowledge levels of physicians with regard to the

"Infancy and Childhood Periods" section of the guide prepared by the Turkish Ministry of Health titled "Periodical Health Examinations and Screening Tests Recommended in Family Medicine Practice" were added to the survey form. This guide was prepared by the Turkish Ministry of Health based on sources, guides, and follow-up protocols of the World Health Organization and other international organizations and current scientific evidence, and the feasibility of the guide within the framework of Primary Care Health Services in Turkey was assessed by Turkish associations and academics working in relevant areas of expertise in two different workshops.[4]

A survey platform (www.surveey.com) was used to convey the survey via e-mail, and questions related to sociodemographic information, questions to assess well child follow-up knowledge of the family physicians, and questions related to practices of the family physicians were collected under separate groups. The link to the survey was sent to e-mail addresses of the family physicians four times with intervals of twenty days to notify them about the research. Also, multiple entries were prevented.

Personal information of the participants was not disclosed in the study, and informed consent was received via the survey link. Surveys of physicians who answered all questions about well child follow-up knowledge were included in the study for analysis.

Statistical Package for Social Sciences (SPSS) for Windows 20 (IBM SPSS Inc., Chicago, USA) was used for statistical analysis. 19 out of 21 questions about knowledge levels of the physicians were scored. Each correct answer was scored as 1 point. The question excluded from the assessment was asked in order to raise awareness among the family physicians about autism, and the question was designed in a way that the "All of the above" was the correct answer. The other question excluded from the assessment was an open-ended question about "Screening Tests Performed with Heel Lance". Four screening tests applied in Turkey were asked to the family physicians with four choices. This question was assessed separately.

Also, the Tukey test was applied for the remaining 19 questions regarding "Knowledge Levels of Family Physicians About Well Child Follow-up" to determine additivity, and it was found that the questions had additivity ($p<0.001$). Thus, the total score for answering all of the survey questions correctly was 19 points. Comparisons were made based on these total scores.

After examining whether the numerical data showed normal distribution, descriptive statistics were presented as mean and standard deviation, whereas categorical data was presented as number and percentage. The distribution of the numerical data was assessed using histogram charts. ANOVA, Chi-Square, and Student t Test, and the Pearson Correlation Analysis were used as hypothesis tests. The Spearman test was employed for non-parametric correlation analysis. The Tukey test was used for post-hoc analysis. $p< 0.05$ was considered to be statistically significant in statistical analysis.

**Results**

A total of 307 family physicians actively working in FHCs located in Ankara between December 1st, 2016 and February 1st, 2017 agreed to participate in our survey (21.33% of the entire population). 191 out of 307 family physicians answered every question in the survey sections regarding sociodemographic information and well child follow-up

knowledge. The remaining 116 family physicians were excluded from the study. Thus, 13.27% of the research population and 62.21% of those who agreed to participate in the study were included in the statistical assessment. Also, the assessment of the final section of the survey was performed with 177 family physicians who completed the last page of the survey regarding practices of family physicians related to well child follow-up.

In terms of sociodemographic characteristics of the participants; 61.78% (n=118) were female and 38.21% (n=73) were male. 13.61% (n=26) of the participants were single, 84.29% (n=161) were married, and 2.09% (n=4) were divorced or widowed. The ages of the participants ranged from 26 to 63, the median age was 45, and the interquartile range (IR) was 13. 16.23% (n=31) of the family physicians had no child, 28.79% (n=55) had 1 child, 46.07% (n=88) had 2 children, 8.89% (n=17) had 3 or more children.

All participants had been practicing medicine for at least 1 year and at most 36 years, the median working time was 20 years, and the IR was 16. Also, the physicians were asked for how long they had been practicing family medicine. It was found that the participants had been practicing family medicine for at least 1 month and at most 149 months, the median working time was 69 months, and the IR was 42. 24.08% (n=46) of the participants were family medicine specialists, 16.75% (n=32) were prospective family medicine specialists in residency training, and 53.40% (n=102) were general practitioners. Also, 5.75% (n=11) answered with "*Other*".

**Knowledge Levels of Family Physicians Regarding Well Child Follow-up**

The survey consisted of 21 questions which were prepared based on the guide titled "Periodical Health Examinations and Screening Tests" in order to determine knowledge levels of the family physicians. Two questions which were not included in the assessment were as follows:

The first question, "*Which of the following is a recommended observation used for early diagnosis of autism spectrum disorders*?", was asked in order to improve knowledge levels of the family physicians regarding autism, which is a disorder that can be overlooked by family physicians. The choices were "*Makes eye contact*", "Reacts to his/her name", "Looks at the pointed object", and "All of the above", which was the correct answer. 90.57% (n:173) of the family physician answered the question correctly. It was observed that this was the question with the highest number of correct answers and achieved its purpose of raising awareness thanks to the test technique and choices' complementing each other.

The other question which was not included in the assessment was an open-ended question: "*What are the screenings performed with heel lance?*" The physicians were asked to write down their answers. The ratio of the family physicians who correctly named all four of the screening tests mentioned in the Turkish Neonatal Screening Program, namely "*Phenylketonuria, Congenital Hypothyroidism, Biotinidase Deficiency, and Cystic Fibrosis*", was 9.94% (n=19), whereas 73.29% (n=140) named 3 out of 4 correctly. The most commonly known screening test was "*Congenital Hypothyroidism"* (n=178), whereas the least commonly known was *"Cystic Fibrosis"* (n=39). On the other hand, the most commonly given incorrect answer was *"Galactosemia*" (n=4).

The remaining 19 questions aimed at determining knowledge levels of the family physicians can be seen in **Table 1** together with correct answers and correct answers' percentages. The average total well child follow-up knowledge score of family physicians was found to be 9.73±2.94 out of 19 points, 3 being the lowest and 17 being the highest score.

**Table 1.** Questions assessing knowledge levels of family physicians regarding well child follow-up, their correct answers, and percentages of correct answers

| **Questions assessing knowledge level regarding well child follow-up** | **Correct answer** | **(%)*** |
|---|---|---|
| **1.** "Which age group does the well child follow-up include?" | "0-18 years" | 21.46% |
| **2.** "Which vaccination is not included in the infancy and childhood vaccination schedule within the scope of the Extended Immunization Program (EIP)?" | "Meningococcus" | 87.43% |
| **3.** "When should the non-preterm infant start taking vitamin D?" | "1st day" | 9.42% |
| **4.** "What dose of vitamin D should be prescribed to neonates?" | "400 IU" | 76.96% |
| **5.** "For how long should vitamin D be used?" | "Until the 12th month" | 82.19% |
| **6.** "When should iron prophylaxis begin?" | "4th month" | 85.34% |
| **7.** "When should the hemoglobin value be checked?" | "9th month" | 83.24% |
| **8.** "Between which months of age should children be examined for palmar pallor?" | "12th-24th months" | 47.64% |
| **9.** "Between which months of age should children be examined for undescended testicle at least once?" | "6th-12th months" | 29.84% |
| **10.** "From which age should visual acuity examination be given once a year in well child follow-ups?" | "3 years" | 56.54% |
| **11.** "In addition to those performed in the first month, between which months of age should the red reflex test and LEA tests be performed?" | "36th-42th months" | 57.59% |
| **12.** "In which week of age and at what weight should all infants be referred to an ophthalmologist for retinopathy of prematurity examination?" | "32nd week and/or below 1500 gr" | 56.02% |
| **13.** "When are family physicians obligated to perform a developmental hip dysplasia (DHD) screening through physical examination to assess risk factors?" | "30th -55th days" | 41.36% |
| **14.** "When should the hearing screening test be administrated?" | "First 72 hours" | 38.74% |
| **15.** "After which percentile (weight-for-height percentile) is the obesity diagnosis made?" | "95%" | 20.94% |
| **16.** "Starting from what age should blood pressure be measured at least once a year?" | "3 years" | 39.79% |
| **17.** "Between which months of age should autism be assessed at least once?" | "18th-36th months" | 31.93% |
| **18.** "When do you take heel lance blood?" | "Between the 3rd and the 5th days" | 69.10% |
| **19.** "Between which months of age should attention deficit disorder, hyperactivity, and specific learning disability be assessed at least once?" | "48th-60th months" | 29.31% |

*The percentages of only correct answer for each question were given on the right side.

No significant difference was found in terms of total score based on gender or marital status. A comparison was made between knowledge levels and titles of the family physicians and no significant difference was found (p=0.116) (**Table 2**).

The total knowledge score of the family physicians had no significant correlation with their age, number of children, and years in the profession, whereas the analysis showed a weak, positive, and significant correlation between the total knowledge score and total working months in FHCs (r=0.147; p=0.042).

Also, the family physicians were asked "*How many times have you read the guide?*"; numbers and percentages were shown in **Table 3**. A significant correlation was observed between the family physicians' total knowledge scores and whether or not they had read the relevant guide (p<0.001).

**Daily Practices of Family Physicians Regarding Well Child Follow-up**

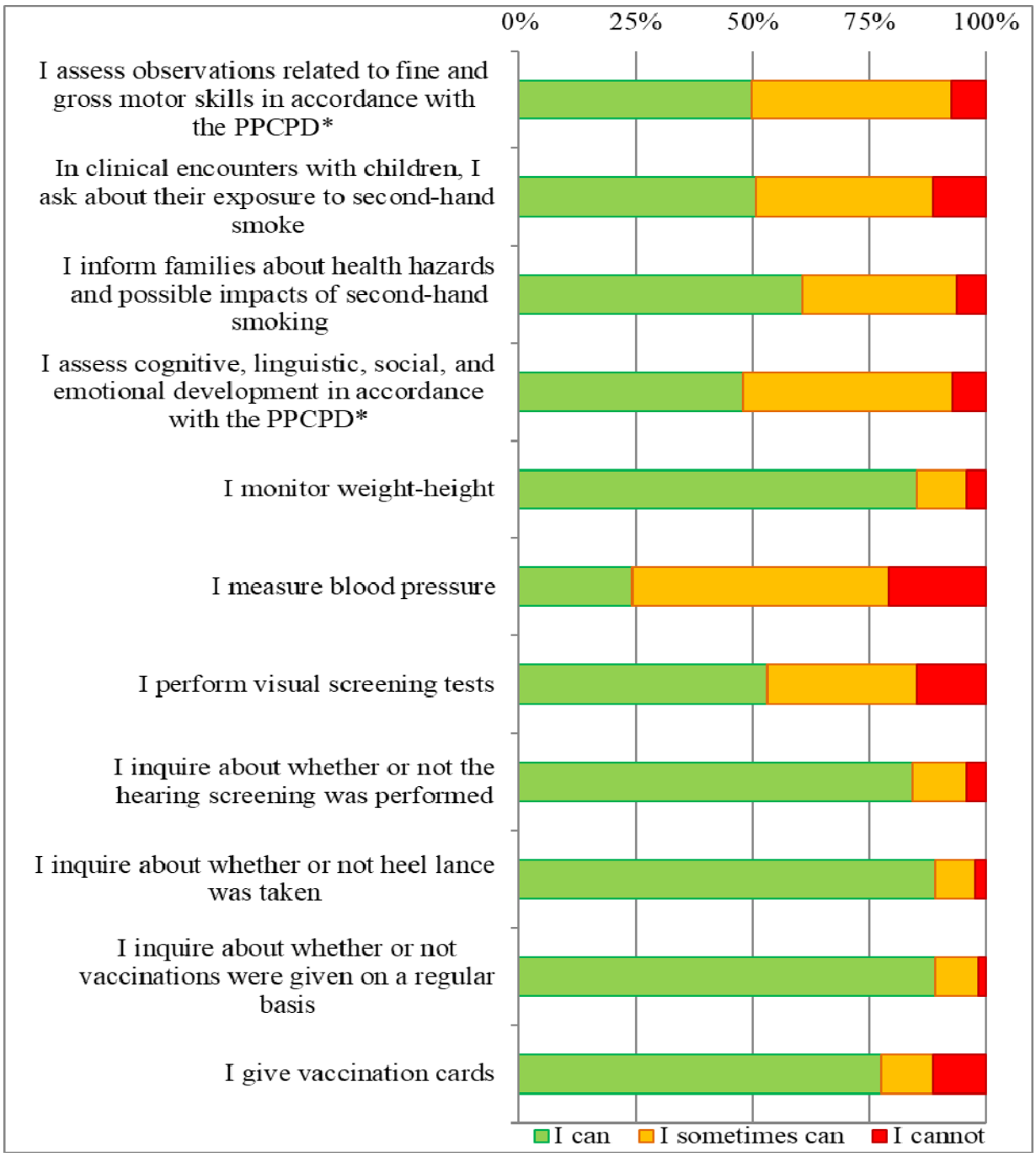
The least common well child follow-up practices carried out by the family physicians were found to be "Blood pressure measurement" and "Vision screening", whereas the most common child follow-up practices carried out by the family physicians were "Ensuring vaccinations are given regularly" and "Ensuring heel lance is taken" (**Figure 1**).

**Table 2.** Comparison of Family Physicians' Titles and Total Knowledge Level Scores

| **Title** | **n** | **mean** | **standard deviation** |
|---|---|---|---|
| Family medicine specialist | 46 | 9.89 | 2.479 |
| Prospective family medicine specialists in residency training | 32 | 9.84 | 2.974 |
| General practitioners. | 102 | 9.84 | 3.130 |
| Other | 11 | 7.64 | 2.378 |
| Total | 191 | 9.73 | 2.945 |

**Table 3.** Comparison Between Number of Guide Reading Numbers Related to Total Levels of Knowledge Level of Well Child Follow-up in Family Physicians

| **Guide Reading Numbers** | **n** | **mean** | **standard deviation** |
|---|---|---|---|
| Never | 60 | 8.63 | 2.358 |
| Partially | 64 | 9.38 | 2.711 |
| Once | 52 | 10.69 | 3.026 |
| Twice or more | 15 | 12.27 | 3.432 |
| Total | 191 | 9.73 | 2.945 |




*PPCPD: Program for Promoting Child's Psychosocial Development

**Figure 1.** Daily practices of family physicians regarding well child follow-up (%).

## Discussion

Well child follow-up is an important responsibility of the family physician. Knowledge levels and practices of family physicians working in FHCs located in Ankara with regard to well child follow-up were assessed in this study which is somewhat a neglected field.

As a result of the study, we found that family physicians performed follow-ups to a large extent, whereas scores showing their knowledge level were low. Tugay et al.

reported that family physicians had moderate knowledge regarding the periodical health examination and screening guide recommended for Turkey; however, they were not able to put their knowledge into practice on a sufficient level.[5]

A comparison was made between knowledge levels and titles of the family physicians and no significant difference was found (p=0.116). The relatively lower number of family medicine specialists compared to general practitioners might have influenced this result. Also, it is possible to say that this subject is not sufficiently emphasized in family medicine residency training. Tugay et al. compared physicians with different titles and found a significant difference in terms of general knowledge score ($p<0.05$).[5] While it is quite an interesting finding that general practitioners had a higher general knowledge score ($\bar{x}$: 3.28) than family medicine specialists ($\bar{x}$: 3.15), it is possible to say that this might be due to insufficient emphasis placed on periodical health examination in residency training. Also, the fact that general practitioners had a higher general knowledge score compared to family medicine specialists might be due to the lower number of family health specialists.[5] Another reason might be that working in the field in relation to primary health care services might have contributed to knowledge levels of general practitioners. Further, it was reported in a study by Attarian et al. that there was no significant difference in the health promotion practices of general practitioners, who had received training within the scope of continuous professional development, and family practitioners, who had completed their residency training.[6] On the other hand, our statistical analysis showed that the number of correct answers to the question "*Which age group does the well child follow-up include?*" was significantly more among family medicine specialists, which points out to the importance of residency training ($x^2=11.28$, p=0.010).

The fact that the physicians limited the well child follow-up to the 0-5 age group is an interesting finding. It is of great importance for raising healthy generations to monitor certain parameters in the 6-18 age group. This finding raises the question whether or not family physicians perform follow-up activities for the 6-18 age group adequately.

The examination of the undescended testicle in neonates is important for early diagnosis of possible health problems in future. Family physicians need to examine neonates for undescended testicle at least once between the 6th and the 12 months. Failure to give this examination in a timely manner may lead to late diagnosis and treatment.[7] That being said, it was revealed in our study that the majority of the physicians did not have sufficient knowledge on the subject.

Hearing screening is quite important for neonates in terms of speech and cognitive development. The screening should be completed within the first month and the hearing loss, if any, should be detected before the third month. If the neonate has hearing problems, a hearing instrument should be fitted in the sixth month follow-up.[4] However, the majority of the family physicians did not have clear knowledge on this subject, and the number of physicians who correctly specify the time of screening was quite low. Considering how important it is to diagnose hearing problems at an early stage, it may be useful to provide family physicians with trainings on the subject to raise awareness and update their knowledge.

Blood pressure measurement should be performed for all children in the 3-18 age group applying to the center for any reason. However, the number of physicians with

adequate knowledge on the subject was found to be low. This finding indicates that the majority of family physicians overlook this subject. It is possible to say that etiological studies are necessary to reveal factors contributing to this situation.

Obesity is one of the underlying reasons of various diseases. In this sense, it is quite important to diagnose and control obesity at an early age. Obesity diagnosis requires certain parameters. One of such parameters is the weight-for-height percentile. Our study revealed that the majority of the family physicians did not know the weight-for-height percentile necessary for obesity diagnosis. In the section assessing their practices, the majority of the physicians specified that they monitored weight-height, whereas the majority had no clear knowledge about obesity diagnosis, which is a surprising finding. This finding indicates that it is necessary to provide family physicians with trainings on obesity diagnosis and treatment.

Autism Spectrum Disorders (ASD) and Attention Deficit and Hyperactivity Disorders (ADHD) are early-life-onset neurodevelopmental disorders. The most appropriate place for determination and monitoring of children in the high-risk group is FHC. For this reason, family physicians must be more equipped on this subject, realize neurodevelopmental disorders and refer cases to relevant units.[8] While the vast majority of the family physicians in our study knew the observations used in early diagnosis of ASD, the number of physicians who accurately specified between which months to assess autism was quite low. Also, only a few of the family physicians correctly answered the question about ADHD and Specific Learning Disability. This finding indicates that the majority of family physicians did not have sufficient information about these subjects as well. Similarly, Sabuncuoğlu et al. found that family medicine assistants in Turkey usually had a low level of knowledge about ASD and ADHD.[8] Also, it was reported in the literature that family physicians, pediatricians, and neurologists had an insufficient level of knowledge about ASD, showed a low rate of accurately detecting ASD, and interpreted characteristics of ASD incorrectly.[9,10] The findings of our study are similar.

It was found that well child follow-up knowledge levels of the family physicians varied based on whether or not they read the guide on which the survey form was based, and total score increased with increasing reading frequency. Similarly, Rourke et al. found that physicians who read and used the guide prepared for well child follow-up followed well child follow-up steps in a more informed and successful manner, which supports our hypothesis.[11]

The correlation between the total working time in FHCs and the knowledge level shows the importance experience in medicine. Also, it is possible to say that trainings held for family physicians providing primary health care services are efficient.

While it was observed that the family physicians did not have the desired knowledge level regarding well child follow-up, it was found in a study conducted by Liebelt et al. that the picture was not any different for pediatricians as well.[12] Once again, the necessity of discussing this matter thoroughly and providing necessary trainings was revealed with this study.

This study showed that the family physicians had a low level of knowledge regarding well child follow-up, and also revealed in which subjects they had shortcomings.

Moreover, it was observed that well child follow-up practices were performed to a large extent; however, the non-mandatory practices were found to be neglected.

According to our results and other findings in the literature, family physicians must update their knowledge regarding well child follow-up, and more trainings should be held on guides used in well child follow-up. It is very important to include periodical examination recommendations published by the Ministry of Health in residency training, as well as putting these recommendations practice. It is also concluded that including periodical health examination in continuous professional development trainings provided for general practitioners with no residency training will greatly contribute to protective health activities within the scope of primary health care services.

With this study, we attempted to demonstrate the status of physicians, who are co-responsibility owners together with families in Well Child Follow-up. Also this study is expected to shed light to prospective studies such as studies addressing health literacy and health-related obligations of families, the other party of co-responsibility.

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