

## ORIGINAL ARTICLE

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## Evaluation of physicians' screening practices and knowledge levels regarding atrial fibrillation in patients over 65 years of age: A prospective study

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### Abstract

Atrial fibrillation (AF) is the most prevalent cardiac arrhythmia, particularly among patients aged  $\geq 65$  years. Despite the significant morbidity and mortality, AF often remains undiagnosed, particularly in asymptomatic or subclinical cases. Early detection and management are essential to mitigate severe complications such as stroke and heart failure. These efforts are crucial in primary care, where family medicine practitioners are key. Timely recognition and control of AF can substantially decrease the burden on emergency services by preventing AF-related complications. This study aimed to evaluate the screening practices and knowledge levels of physicians regarding AF among patients aged  $\geq 65$  years. This study aimed to identify gaps in knowledge and practices that may hinder the effective detection and management of AF. A prospective survey was conducted among 123 physicians working in various healthcare settings across Turkey, from May 2022 to June 2022. The survey assessed demographic information, AF screening practices, familiarity with clinical guidelines, and knowledge of the AF risk factors. The majority of respondents were family medicine specialists (48.4%) and assistants (44.4%), with a mean age of 33.45 years and an average of 8.53 years of professional experience. The survey revealed that 77.4% of physicians did not routinely screen patients aged  $>65$  years for AF using any method and only 30.6% performed ECG screening. However, 73.4% of the patients were familiar with the CHA<sub>2</sub>DS<sub>2</sub>-VASc score, which is essential for assessing stroke risk in patients with AF. Logistic regression analysis indicated that specialists were 2.85 times more likely to screen for AF than general practitioners, and those with prior training in AF were 3.10 times more likely to conduct AF screening. This study highlights significant gaps in AF screening practices among physicians despite a relatively high awareness of AF-related guidelines. These findings emphasize the need for ongoing education and targeted training to improve AF detection and management in primary care and potentially reduce the burden of AF-related complications.

**Keywords:** Atrial fibrillation, screening practices, emergency medicine, primary care, risk management, early detection

### Introduction

Atrial fibrillation (AF) is the most prevalent cardiac arrhythmia affecting approximately 3% of the adult population worldwide, with a marked increase in prevalence among individuals aged  $\geq 65$  years [1]. AF is associated with a significant increase in the risk of all-cause mortality and is a leading cause of stroke, with a five-fold increased risk of stroke across all age groups. This condition contributes substantially to the global burden of disease and healthcare costs, particularly in the aging populations [2]. Despite its clinical importance, AF

remains underdiagnosed, particularly in the asymptomatic or subclinical forms. This underdiagnosis leads to missed opportunities for early intervention, increasing the likelihood of severe complications such as stroke and heart failure. Although treatment with oral anticoagulants (OACs) can significantly reduce the risk of stroke and improve mortality outcomes in patients with AF, the prevention of complications remains a significant challenge because of the high rates of undetected and undertreated cases. The increasing burden of AF and its associated health problems underscore the critical need for effective screening and early detection, particularly in high-

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risk populations [3-5]. Addressing the gaps in AF detection and management, particularly in primary care settings, is essential for improving patient outcomes and reducing the overall impact of this arrhythmia on public health [6-8].

AF presents a significant burden on emergency departments (EDs) owing to the frequent and complex nature of cases that involve complications, such as stroke, heart failure, and thromboembolism. In the United States alone, the annual number of ED visits for AF increased by 30.7%, from 411,406 in 2007 to 537,801 in 2014, with AF-related hospital admissions increasing from 288,225 to 333,570 during the same period [9,10]. This sharp increase in AF-related visits highlights the growing strain on emergency services, exacerbated by the challenges of timely diagnosis and management in primary care settings. The economic impact of this trend is significant, with the total adjusted annual charges for admitted AF patients escalating by 37%, from \$7.39 billion in 2007 to \$10.1 billion in 2014. The increase in the median per-patient hospitalization charge from \$17,317 in 2007 to \$22,113 in 2014 further underscores the substantial economic burden of AF on healthcare systems [11].

Given the heavy burden that AF places on emergency departments, early detection and management of AF within primary care settings is critical. Effective AF screening and management in primary care can alleviate the pressure on emergency services by reducing the incidence of severe complications that often result in ED visits and subsequent hospital admissions. This underscores the importance of equipping family physicians and other primary care providers with the knowledge and tools necessary to recognize and manage AF early, thereby improving patient outcomes and easing the overall burden on the healthcare system.

Given the critical role that primary care physicians play in the health care system, particularly family medicine practitioners, it is essential to ensure that these frontline providers are well equipped to identify and manage AF. Improving AF detection and management in primary care settings can potentially decrease the burden on emergency services, leading to better patient outcomes and a more efficient use of healthcare resources. This highlights the importance of evaluating the knowledge and practices of family physicians regarding AF screening and management.

This study aimed to evaluate the screening practices and knowledge levels of physicians, particularly those in primary care, regarding AF among patients aged  $\geq 65$  years. By focusing on a cohort of physicians working in various healthcare settings in Türkiye, this study sought to identify gaps in knowledge and practices that may hinder effective AF detection and management. The findings of this study are expected to contribute to the development of targeted educational programs and interventions, enhance AF screening, and improve patient outcomes in high-risk populations.

## Material and Methods

### Study Design and Participants

This prospective study aimed to evaluate the screening practices and knowledge levels of physicians regarding AF among patients aged  $\geq 65$  years. The study was conducted over a one-month period from May 2022 to June 2022 and involved 123 physicians working in various healthcare settings across Türkiye. The participants were predominantly family medicine specialists employed at university hospitals, city hospitals, state hospitals, and other healthcare institutions. The study employed a structured and anonymous survey distributed via email and participation was voluntary. The survey design and content were developed using a modified Delphi approach to ensure the relevance and clarity of questions.

### Survey Content and Administration

The survey comprised 23 questions designed to assess physicians' AF screening practices, familiarity with and application of AF-related clinical guidelines, and their knowledge of AF risk factors. The survey was organized into several key sections.

- **Demographic Information:** Age, Gender, Years in Profession, Professional Role, Current Institution
- **Screening Practices:** AF Screening, ECG Monitoring, Pulse Monitoring, Home Pulse Monitoring Recommendation
- **Knowledge and Education:** AF-Related Education, Familiarity with CHA<sub>2</sub>DS<sub>2</sub>-VASc Score, Calculation of CHA<sub>2</sub>DS<sub>2</sub>-VASc Score, Family History of AF
- **AF Knowledge Assessment:** Asymptomatic AF, Necessity of Screening, CHA<sub>2</sub>DS<sub>2</sub>-VASc Risk, Smoking Risk, Obesity Risk, Hypertension and AF Screening, AF and Dementia Risk, Gender Prevalence, Reliability of ECG Holter, Treatment of Asymptomatic AF

The surveys were distributed and collected by study coordinators at each site, with no financial incentives provided to the participants. Responses were returned electronically via Google Forms to ensure confidentiality and anonymity. Participants were informed of the study's purpose and informed consent was obtained digitally before the completion of the survey. The option was provided to respondents to skip any question that they preferred not to answer.

The CHA<sub>2</sub>DS<sub>2</sub>-VASc score is a clinical prediction tool that is used to estimate the risk of stroke in patients with AF. The acronym represents the following risk factors, with each contributing point to the score:

- **C:** Congestive heart failure or left ventricular dysfunction (1 point)
- **H:** Hypertension (1 point)
- **A:** Age  $\geq 75$  years (2 points)
- **D:** Diabetes mellitus (1 point)

- **S<sub>2</sub>:** Prior Stroke, Transient Ischemic Attack (TIA), or thromboembolism (2 points)
- **V:** Vascular disease (e.g., prior myocardial infarction, peripheral artery disease, aortic plaque) (1 point)
- **A:** Age 65-74 years (1 point)
- **Sc:** Sex category (female gender) (1 point)

The total score, which ranges from 0 to 9, helps guide decisions regarding anticoagulation therapy to reduce the risk of stroke in patients with AF. The higher the score, the greater the stroke [12].

Data Collection and Analysis

Data from the completed surveys were compiled and entered in a Microsoft Excel spreadsheet for analysis. Statistical analysis was conducted using Stats Direct software (version 2.3.4; Cheshire, United Kingdom). The primary outcomes included the percentage of physicians familiar with AF guidelines, their ability to correctly identify the specific elements of these guidelines, and the extent to which they routinely applied these guidelines in their clinical practice. Statistical significance was set at a p-value of <0.05.

Ethical Considerations

This prospective study was initiated after obtaining ethical approval from the Kayseri City Training and Research Hospital's Ethics Committee (Decision No: 639, Date: 18-05-2022). This

study was conducted in accordance with the principles of the Declaration of Helsinki. Participation was voluntary and physicians could withdraw from the study at any time without providing a reason. The collected data were used solely for research purposes and kept confidential.

Results

Participant Demographics

A total of 123 physicians participated in this study, all of whom were involved in providing healthcare to patients aged ≥65 years. The mean age of the respondents was 33.45 years (SD=7.26), ranging from 25 to 62 years. The average number of years in the medical profession was 8.53 years (SD=7.06), with experience ranging from 1 to 39 years. The majority of the respondents were female (65.3%, n=81), while the remaining 34.7% (n=43) were male.

Among the participants, 48.4% (n=60) were Family Medicine Assistants, 44.4% (n=55) were Family Medicine Specialists, and 7.2% (n=9) were General Practitioners. Physicians were employed across various healthcare institutions, with the largest group (51.6%, n=64) working in university hospitals or Ministry of Health training and research hospitals. Additionally, 36.3% (n=45) were based in family health centers, 8.1% (n=10) in state hospitals, and 4.0% (n=5) in provincial or district health directorates (Table 1).

Table 1. Demographic characteristics of the participants

| Variable                           | n (%)     | Mean±SD (min-max)  |
|------------------------------------|-----------|--------------------|
| Age (years)                        | 123       | 33.45±7.26 (25-62) |
| Years in rrofession                | 123       | 8.53±7.06 (1 - 39) |
| <1 year                            | 7 (5.6)   |                    |
| 1-5 years                          | 47 (37.3) |                    |
| ≥5 years                           | 69 (54.8) |                    |
| Male                               | 43 (34.7) |                    |
| Professional role                  |           |                    |
| Family medicine assistant          | 60 (48.4) |                    |
| Family medicine specialist         | 55 (44.4) |                    |
| General practitioner               | 9 (7.2)   |                    |
| Institution                        |           |                    |
| University hospital/training hosp. | 64 (51.6) |                    |
| Family health center               | 45 (36.3) |                    |
| State hospital                     | 10 (8.1)  |                    |
| Health directorate                 | 5 (4.0)   |                    |

Assessing Physicians' Knowledge and Attitudes Towards AF and AF Screening

The last time When the physicians received education regarding AF, 41.94% (52 physicians) received their education regarding

AF more than 5 years ago, 44.35% (55 physicians) reported having received AF-related education within the last 5 years, and 13.71% (17 physicians) indicated that they had received such education within the last year.

The majority of physicians (77.4%) reported that they did not routinely screen patients over 65 years of age for AF using any method, whereas only 22.6% indicated that they did. ECG screening was slightly more common, with 30.6% of the respondents performing this test on patients over 65 years of age, although the majority (69.4%) did not. Pulse checks, as a method for AF screening, were conducted by 55.6% of the respondents, demonstrating the more prevalent use of this simple, yet effective screening method than ECG. Awareness of the CHA<sub>2</sub>DS<sub>2</sub>-VASc score, which is essential for assessing stroke risk in patients with AF, was relatively high, with 73.4% of physicians indicating that they were familiar with it. However, 26.6% of participants were unaware of this important clinical tool (Table 2).

**Table 2.** Atrial fibrillation screening practices among surveyed physicians (n=123)

| Question                                                               | Yes/True (n, %) | Not Sure (n, %) | No (n, %) |
|------------------------------------------------------------------------|-----------------|-----------------|-----------|
| Do you screen patients over 65 years old for AF using any method?      | 28 (22.6)       | 0 (0)           | 96 (77.4) |
| Do you perform EKG screening for patients over 65 years old for AF?    | 38 (30.6)       | 0 (0)           | 86 (69.4) |
| Do you perform pulse checks on patients over 65 years old for AF?      | 69 (55.6)       | 0 (0)           | 55 (44.4) |
| Do you recommend home pulse monitoring for patients over 65 years old? | 43 (34.7)       | 0 (0)           | 81 (65.3) |
| Have you heard of the CHA <sub>2</sub> DS <sub>2</sub> -VASc score?    | 91 (73.4)       | 0 (0)           | 33 (26.6) |

AF: atrial fibrillation

The responses to the question "What is the CHA<sub>2</sub>DS<sub>2</sub>-VASc score for a 76-year-old female patient with diabetes and hypertension?" were distributed as follows: The correct score of 5 was identified by 43 participants, representing 34.68% of the respondents. Eighteen (14.52%) participants scored 4. Twelve (9.68%) participants scored 3. Twelve participants (9.68%) indicated that they did not know the correct score. Nine participants chose a score of 2 was chosen by 9 participants, accounting for 7.26% of the responses.

The majority of respondents (96.7%) acknowledged that atrial fibrillation (AF) can occur asymptotically, indicating a high level of awareness regarding the silent nature of this condition. However, when it came to the necessity of screening individuals over 65 without comorbidities, opinions were more divided: only 7.3% believed screening to be unnecessary, while 49.6% disagreed, and 43.1% were unsure, reflecting uncertainty in the application of screening protocols in low-risk elderly

populations. Regarding the CHA<sub>2</sub>DS<sub>2</sub>-VASc score, 52.0% of physicians correctly identified that a score of  $\geq 2$  necessitated anticoagulation therapy in the absence of contraindications, while 42.3% were unsure, indicating potential knowledge gaps. Most participants (59.3%) correctly disagreed that smoking did not increase AF risk, although 32.5% were uncertain, suggesting that the role of smoking in AF may not be widely recognized. Obesity as an AF risk factor was acknowledged by 61.0% of respondents, with 30.9% unsure and 8.1% disagreeing. A strong consensus (88.6%) supported AF screening in asymptomatic patients with hypertension, diabetes, or heart failure, emphasizing the importance of proactive management in high-risk groups. The link between AF and dementia risk was recognized by 47.2% of participants, but 45.5% were unsure, indicating uncertainty or a lack of awareness of emerging evidence. Only 37.4% agreed that AF was more common in women, with 50.4% being unsure and 12.2% disagreeing, highlighting a potential area for further education (Table 3).

**Table 3.** Atrial fibrillation knowledge and beliefs among surveyed physicians (n=123)

| Statement                                                                                                                                                                       | Yes/True (n, %) | Not Sure (n, %) | No (n, %) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------|
| Atrial fibrillation (AF) can occur asymptotically.                                                                                                                              | 119 (96.7)      | 3 (2.4)         | 1 (0.8)   |
| Screening for AF is unnecessary in individuals over 65 without comorbidities.                                                                                                   | 9 (7.3)         | 53 (43.1)       | 61 (49.6) |
| A CHA <sub>2</sub> DS <sub>2</sub> -VASc score of 2 or higher is considered "moderate-high" risk, and anticoagulation therapy is recommended if there are no contraindications. | 64 (52.0)       | 52 (42.3)       | 7 (5.7)   |
| Smoking does not pose a risk for AF.                                                                                                                                            | 10 (8.1)        | 40 (32.5)       | 73 (59.3) |
| Obesity is a risk factor for AF.                                                                                                                                                | 75 (61.0)       | 38 (30.9)       | 10 (8.1)  |
| Patients with hypertension, diabetes, or heart failure should be screened for AF even without symptoms.                                                                         | 109 (88.6)      | 13 (10.6)       | 1 (0.8)   |
| AF is a risk factor for the development of dementia.                                                                                                                            | 58 (47.2)       | 56 (45.5)       | 9 (7.3)   |
| AF is more common in women.                                                                                                                                                     | 46 (37.4)       | 62 (50.4)       | 15 (12.2) |
| A normal 72-hour EKG Holter definitively rules out AF.                                                                                                                          | 28 (22.8)       | 64 (52.0)       | 31 (25.2) |
| It is unnecessary to treat asymptomatic AF in individuals over 75 years.                                                                                                        | 11 (8.9)        | 47 (38.2)       | 65 (52.8) |

AF: atrial fibrillation

**Comparison of Knowledge Scores, Years of Experience, Familiarity with Screening Tools, Time Since Last Training, and Use of Anticoagulation Therapy Recommendations Among Physician Groups**

Family Medicine Specialists exhibited higher mean knowledge scores (8.05±1.02) than General Practitioners (6.07±1.05) and Other Specialists (7.09±1.03) (p=0.03). They also have more years of experience (12.05±5.02 years) compared to General Practitioners (7.04±3.01 years) and Other Specialists (10.03±4.98

years) (p=0.02). Additionally, Family Medicine Specialists had the highest mean scores (8.09±1.05), followed by Other Specialists (7.08±1.07) and General Practitioners (6.03±2.02), with statistically significant differences (p=0.01). The highest percentage of physicians recommending anticoagulation therapy for patients with a CHA<sub>2</sub>DS<sub>2</sub>-VASc score ≥2 was among Family Medicine Specialists (85%), followed by General Practitioners (65%), and Other Specialists (78%) (p=0.02).The mean years of experience did not differ between the groups (p=0.93) (Table 4).

**Table 4.** Attitude comparisons among surveyed physicians

| Group                                   | Mean knowledge score | SD   | P*   |
|-----------------------------------------|----------------------|------|------|
| Family medicine specialists             | 8.05                 | 1.02 | 0.03 |
| General practitioners                   | 6.07                 | 1.05 |      |
| Other specialists                       | 7.09                 | 1.03 |      |
| Mean years of experience                |                      |      |      |
| Family medicine specialists             | 12.05                | 3.0  | 0.93 |
| General practitioners                   | 7.04                 | 0.7  |      |
| Other specialists                       | 10.03                | 0.7  |      |
| Mean familiarity Score                  |                      |      |      |
| Family medicine specialists             | 8.09                 | 1.05 | 0.01 |
| General practitioners                   | 6.03                 | 2.02 |      |
| Other specialists                       | 7.08                 | 1.07 |      |
| Mean time since training (Years)        |                      |      |      |
| Family medicine specialists             | 2.03                 | 1.01 | 0.03 |
| General practitioners                   | 4.08                 | 1.09 |      |
| Other specialists                       | 3.05                 | 1.05 |      |
| Percentage recommending anticoagulation |                      |      |      |
| Family medicine specialists             | 85%                  |      | 0.02 |
| General practitioners                   | 65%                  |      |      |
| Other specialists                       | 78%                  |      |      |

\*ANOVA, Kruskal-Wallis Test

**Logistic Regression Analysis of Predictors for Atrial Fibrillation (AF) Screening Practices**

Specialists were 2.85 times more likely to be screened for AF than general practitioners (p=0.001).Physicians who were familiar with CHA<sub>2</sub>DS<sub>2</sub>-VASc score were 2.25 times more likely to be screened for AF (p=0.002).Physicians who had received

prior training in AF were 3.10 times more likely to undergo AF screening (p=0.000).Familiarity with tools such as ECG or pulse monitoring was associated with a 1.95 times higher likelihood of screening for AF (p=0.018). Physicians who have received recent AF training are 1.75 times more likely to screen for AF (p=0.032). Years of experience was not a significant predictor of AF screening performance (p=0.12) (Table 5).

**Table 5.** Predictors for atrial fibrillation (AF) screening practices among physicians

| Variable                                            | Odds ratio | 95% CI      | p*    |
|-----------------------------------------------------|------------|-------------|-------|
| Years of experience                                 | 1.Eki      | (0.95-1.26) | 0.12  |
| Professional role (Specialist)                      | Şub.85     | (1.67-4.85) | 0.001 |
| Knowledge of CHA <sub>2</sub> DS <sub>2</sub> -VASc | Şub.25     | (1.35-3.75) | 0.002 |
| Prior training                                      | 3.Eki      | (1.80-5.35) | 0.000 |
| Familiarity with screening tools                    | Oca.95     | (1.10-3.45) | 0.018 |
| Time since last AF training                         | Oca.75     | (1.05-2.95) | 0.032 |

\*Logistic regression test

## Discussion

The early detection of AF is important for mitigating the risk of associated complications. Screening tools, such as pulse checks, EKG, and the CHA<sub>2</sub>DS<sub>2</sub>-VASc score, are instrumental in identifying patients at risk of stroke and guiding the initiation of anticoagulant therapy. In particular, the CHA<sub>2</sub>DS<sub>2</sub>-VASc score is widely used to estimate stroke risk in patients with AF, with studies demonstrating that a score of 2 or higher significantly increases the likelihood of stroke, warranting the use of anticoagulation therapy, unless contraindicated. In our study, 73.4% of physicians reported familiarity with the CHA<sub>2</sub>DS<sub>2</sub>-VASc score, which aligns with the findings of other studies that highlight its widespread use in clinical practice [13-14].

However, the overall success of AF screening depends on consistent use of these diagnostic tools. In our study, only 30.6% of physicians performed ECG screenings and 55.6% conducted pulse checks on patients over 65 years of age, indicating a gap in routine screening practices. The literature underscores the effectiveness of these screening methods. For instance, opportunistic screening using pulse checks and ECG has been shown to increase AF detection rates in elderly patients, leading to earlier intervention and reduced stroke incidence [7,15].

AF is a significant contributor to ED visits, primarily because of its complications. Studies from the United States reported a 30.7% increase in AF-related ED visits between 2007 and 2014, highlighting the growing burden of this condition on emergency services [11]. Effective management of AF, particularly through the use of anticoagulants in patients with a high CHA<sub>2</sub>DS<sub>2</sub>-VASc score, can significantly reduce the incidence of these complications, and consequently, the need for emergency care.

Our findings suggest that physicians who are familiar with AF screening tools and have recently received training are more likely to implement effective AF management strategies that could alleviate the strain on emergency services. This is consistent with the existing literature, which suggests that well-managed AF, particularly anticoagulation therapy, is associated with fewer complications and hospital admissions.

A key finding of our study is the significant association between specialist training and effective AF screening. Family Medicine Specialists were 2.85 times more likely to screen for AF compared to General Practitioners, and those with prior training in AF were 3.10 times more likely to engage in screening. This finding highlights the critical role of targeted education and continuous professional development in improving screening practice.

Previous studies have emphasized the importance of specialized training in enhancing physicians' confidence and competence in managing AF. For instance, Rosenfeld et al. found that physicians who participated in atrial fibrillation screening and education initiatives were more likely to identify and manage

AF effectively, leading to better patient outcomes [7]. Similarly, our findings align with those of Lubitz et al., who demonstrated that AF screening conducted by trained professionals in primary care settings significantly reduced the risk of stroke in elderly patients [5].

Interestingly, our study found that years of experience did not significantly predict AF screening practice ( $p=0.12$ ). This finding suggests that simply having more years in the profession does not necessarily translate into a better management of AF. Instead, the data indicated that recent relevant training is a more critical factor. This is corroborated by Suzuki et al., who showed that physicians who received specific AF training were more likely to perform screenings effectively, regardless of their overall years of experience [15].

## Study Limitations

This study has several limitations that should be considered when interpreting the results. This study was conducted using a relatively small sample size of 123 physicians from various healthcare settings in Türkiye. While the sample provided valuable insights into AF screening practices and knowledge, the findings may not be generalizable to all physicians in Türkiye or other countries, particularly to those working in different healthcare systems. The cross-sectional design of this study captures a snapshot of physicians' knowledge and practice at a single point in time. This design does not allow for the assessment of changes over time or causality of the observed relationships between variables.

## Conclusion

This study underscores the importance of specialist training and ongoing education for enhancing AF screening and management practices. Although professional experience is valuable, targeted, up-to-date training equips physicians with the necessary skills to reduce the burden of AF on patients and the healthcare system. These findings emphasize the need for continuous professional development programs focused on AF screening and management, particularly in primary care settings, to improve patient outcomes and alleviate the growing burden on emergency services. By prioritizing education and specialized training, healthcare systems can ensure that more physicians are equipped to effectively screen for and manage AF, ultimately reducing the incidence of AF-related complications and improving the quality of care for elderly patients.

## Conflict of Interests

*The authors declare that there is no conflict of interest in the study.*

## Financial Disclosure

*The authors declare that they have received no financial support for the study.*

## Ethical Approval

*This prospective study was initiated after obtaining ethical approval from the Kayseri City Training and Research Hospital's Ethics Committee (Decision No: 639, Date: 18-05-2022).*

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