

Factors influencing antidepressant prescribing in general practice: a national cross-sectional study

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Research Article

Keywords: Primary health care, general practice, quality of health care, antidepressants, continuing medical education, mental health, professional practice assessment

Posted Date: July 1st, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9948594/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background

Depression is a common condition in primary care, and most antidepressant prescriptions are issued by general practitioners. However, the quality of these prescriptions varies based on several factors, including practice setting, mental health training, and organizational constraints. This study aimed to analyze how practice status and level of mental health training affect the quality of antidepressant prescribing in primary care by evaluating adherence to clinical guidelines.

Methods

A cross-sectional survey was conducted among general practitioners, using an anonymous questionnaire distributed between February and May 2025. The questionnaire examined prescribing practices, training received, constraints encountered, and professional profile. Prescribing appropriateness was assessed using four criteria based on French National Authority for Health recommendations: confirmed diagnosis of a major depressive episode, assessment of severity, consideration of non-pharmacological treatment options, and follow-up planning. Associations were analyzed using bivariate and multivariate analyses (logistic regression adjusted for age and sex).

Results

Among the prescriptions analyzed, 81.1% were considered appropriate. Locum physicians were overrepresented in the inappropriate prescribing group, accounting for 52.8% ($n = 47$) of cases, compared with 33.5% ($n = 128$) in the appropriate group. The proportion of physicians who had received mental health training, regardless of duration, was significantly higher in the appropriate prescribing group (39.8%, $n = 153$) than in the inappropriate group (21.3%, $n = 19$), suggesting a positive association between training and prescribing quality ($p = 0.001$; OR = 2.46; 95% CI: 1.42–4.25). Perceived competence in mental health further strengthened this association. In the multivariate analysis, time constraints during consultations significantly increased the risk of inappropriate prescribing (aOR = 3.66; 95% CI [1.75–7.60]; $p < 0.001$), while mental health training remained an independent protective factor (aOR = 0.50; 95% CI [0.27–0.91]; $p = 0.02$).

Conclusion

This study highlights the impact of professional status and mental health training on the quality of antidepressant prescribing. Locum status and the absence or inadequacy of mental health training were significantly associated with inappropriate prescribing. These findings underscore the need to

strengthen mental health training, including brief training interventions, particularly for early-career and locum physicians.

INTRODUCTION

Depression is a common and disabling mental health condition, affecting nearly 280 million people worldwide [1]. It extends beyond transient sadness, with major consequences for both individual quality of life and society as a whole. It is estimated that one in five individuals will experience a depressive episode during their lifetime. This condition is potentially life-threatening, particularly due to a high risk of suicide [1].

In France, approximately 12% of adults report having experienced a depressive episode during their lifetime, with a higher prevalence among women and older adults [2]. The COVID-19 pandemic further exacerbated the situation. During its first year, an increase of more than 25% in cases was recorded, directly due to successive lockdowns and reduced social interactions, which had a considerable impact on psychological well-being [3].

In this context, general practitioners (GPs) play a crucial role, particularly through antidepressant prescribing, which remains one of the main therapeutic approaches. According to Kovess-Masféty et al. (2007), GPs are responsible for 90% of antidepressant prescriptions in France and serve as the first point of contact for mental health care [4]. However, the quality of antidepressant prescribing is regularly questioned, partly due to insufficient training in mental health. The study by Darmon et al. (2015) showed that 90% of consultations in French general practice result in a prescription, compared with 83% in Spain, 72% in Germany, and only 43% in the Netherlands [5]. In a context of psychiatrist shortage, GPs are often required to initiate antidepressant or anxiolytic treatments, sometimes without a thorough assessment.

Two recent studies highlight the importance of adequate mental health training. In India, Pillai et al. (2021) found that 31% of patients received an antidepressant without a formal diagnosis of a major depressive episode (MDE) [6]. In Spain, Gonzalez et al. (2023) showed that physicians relied more on personal experience than on scientific evidence to guide their prescribing decisions [7]. These findings illustrate potential deviations from best practice and underscore the need for both initial and continuing mental health training.

Given the rising use of anxiolytic and antidepressant medications—France Ranking among the highest consumers in Europe [8]—several factors may influence prescribing, With physician's practice status emerging as a key determinant. The number of locum physicians has grown significantly, from 6,936 in 2010 to 9,234 in 2022 (+ 33.1%) [9]. These physicians face specific working conditions, such as shorter consultations, limited access to medical records, and a lack of longitudinal follow-up. Briffaut et al. (2010) demonstrated that these constraints can lead to rapid decision-making and inappropriate prescribing [10]. While essential for maintaining access to care, particularly in underserved areas, these practitioners may encounter specific difficulties in managing mental health.

Regarding training, Mercier et al. (2015) reported that 30% of GPs had received no specialized mental health training [11] and that they often favored pharmacological treatments over psychotherapeutic approaches. Continuing medical education (CME) is a key lever for improving GPs' competence in managing psychiatric conditions in primary care.

In France, initial training in mental health is often considered insufficient, leaving practitioners poorly prepared to effectively manage common conditions such as depression or anxiety [12]. This training gap is compounded by barriers to regular access to CME for many physicians, particularly locum physicians or those practicing in isolation, as highlighted in a recent thesis on the subject [13]. Regulatory changes have also restricted access to CME: since the decree of November 14, 2019, non-contracted and non-established locum physicians have no longer been eligible for funding under the national continuing professional development (CPD) scheme [14]. Particularly affecting early-career physicians, this measure contributes to widen inequalities in access to training. However, without the continuity of longitudinal practice, these professionals may default to more reactive prescribing behaviors, potentially overlooking non-pharmacological approaches.

At the international level, the positive impact of CME is widely recognized. In Ireland, McBride et al. (2022) showed that 73.9% of physicians trained through CPD reported improved patient management, and 74.9% reported positive changes in their practices [15]. Papachristopoulos et al. (2023) confirmed this trend, emphasizing that CME strengthens GPs' skills in managing mental health conditions [16]. In 2024, Grigoroglou et al. observed that locum physicians, due to lower continuity of care and limited access to CME, were more likely to prescribe antidepressants rapidly, without considering non-pharmacological options [17]. However, the use of these medications raises concerns because of their potential for misuse, potential of dependence, potential of associated adverse effects, and drug interactions [18].

Several features inherent to locum practice — limited patient familiarity, restricted mental health training, shorter consultations, and lack of longitudinal follow-up — may collectively predispose toward inappropriate antidepressant prescribing. Better understanding of the factors associated with inappropriate antidepressant prescribing is therefore critical to improve first-line care. Our aim was to identify factors associated with the quality of antidepressant prescribing for anxiety and depressive symptoms in primary care, as assessed using an appropriateness score based on French National Authority for Health (*Haute Autorité de Santé* [HAS]) recommendations [19].

MATERIALS AND METHODS

Study Design

We conducted a quantitative cross-sectional survey using an anonymous questionnaire to collect information on antidepressant prescription use in general practice, diagnostic criteria applied, treatment

options considered, and physicians' mental health training. Data collection took place from February 3 to May 8, 2025.

Target Population and Sampling

The target population consisted of GPs practicing in France, including both, locum physicians working temporarily in various practices and established physicians. The questionnaire was distributed in two phases. The first phase, conducted from February 3 to April 4, 2025, was disseminated through official institutional channels, including departmental medical regulatory bodies and regional or departemental organizations representing physicians (*Conseils Départementaux de l'Ordre des Médecins* [CDOM] and *Unions Régionales des Professionnels de Santé* [URPS]).

Due to a progressive decline in the response rate, a second phase was launched from April 5 to May 8, 2025, through closed professional groups on social media and locum-specific groups accessible exclusively to physicians. Although this approach was non-probabilistic, it aimed to ensure adequate representation of both physician categories.

Inclusion Criteria

Inclusion criteria comprised licensed GPs, whether locum or established, practicing in France and recording to the medical council. Exclusion criteria comprised psychiatrists, residents (including those holding a locum license), physicians who had prescribed antidepressants outside the context of anxiety and depressive symptoms, and professionals who had participated in the questionnaire pilot testing were excluded from the study.

Primary Outcome Measure

The primary outcome measure was the appropriateness of antidepressant prescribing, defined with HAS recommendations for the management of MDEs in primary care. The appropriateness score was based on four clinical criteria directly derived from these recommendations: confirmed diagnosis of MDE, severity assessment, consideration of non-pharmacological treatment options (such as psychotherapy), and planned short- or medium-term medical follow-up [19]. These four criteria were operationalized as binary questions in the questionnaire. Prescriptions were considered appropriate when all four criteria received a positive response and inappropriate when at least one criterion received a negative response.

Data Collection Tool: Anonymous Questionnaire

The questionnaire addressed four main domains: baseline characteristics, antidepressant prescribing practices, level of mental health training, and challenges encountered in daily practice. It included multiple-choice questions, self-assessment scales, and items exploring factors influencing prescribing

decisions (Appendix 1). A pilot test was conducted among psychiatrists, psychologists, and GPs to ensure the relevance and clarity of the questionnaire items. The questionnaire was distributed over a total period of 13 weeks, with targeted reminders sent to improve the response rate.

Data Analysis

Incomplete questionnaires were excluded from the analysis. Quantitative variables were summarized using means and standard deviations, while qualitative variables were described using counts and percentages. Comparisons between locum and established physicians were performed using the chi-square test for qualitative variables and the Student's *t* test for quantitative variables. Results were expressed as crude odds ratios with 95% confidence intervals.

A multivariable analysis model by logistic regression was fitted, modelling the probability of the initiation of antidepressant therapy not conforming to HAS criteria. Variables included in the model were selected by expert opinion. Direct components of HAS conformity were not included as predictors as they are trivially related to the outcome. Age and gender were included in the model to ensure sociodemographic adjustment, regardless of the bivariate analysis *p*-value. Results of the multivariable analysis were expressed as Odds Ratios, and also expressed directly as adjusted percentage differences, using the Average Marginal Effects (AME) method. Model performance was evaluated by the Area Under the receiver operating characteristics Curve (AUC), and with Nagelkerke's pseudo- R^2 . Model calibration was assessed with the Hosmer-Lemeshow test.

A *p* value < 0.05 was considered statistically significant. The analysis was realized with R software, version 4.3.3 (The R Foundation for Statistical Computing, Vienna, Austria).

Ethics

This study did not fall within the scope of the Jardé Law, as it involved neither human participant intervention nor the collection of sensitive health data. No personal data were processed, thereby ensuring full anonymity for the participants. As the survey was strictly declarative and observational, no approval from an ethics committee (*Comité de Protection des Personnes* [CPP]) or authorization from the French Data Protection Authority (*Commission Nationale de l'Informatique et des Libertés* [CNIL]) was required.

RESULTS

Sociodemographic and Professional Characteristics of the Study Population

This study included 471 licensed GPs practicing in France. Participant characteristics are shown in Table 1. Regarding professional status, 296 physicians (62.8%) were established physicians and 175

(37.2%) were locum physicians. A total of 291 physicians practiced in group settings (61.8%), compared with 180 (38.2%) in solo practice.

Table 1
Baseline Characteristics of the Study Population (*N* = 471)

Variables	Categories/Statistics	<i>n</i> (%)
Gender	Female	339 (72.0)
	Male	132 (28.0)
Age (years)	Mean $\pm$ standard deviation	38.5 $\pm$ 10.9
	Median (min–max)	35.0 (26.0–77.0)
	Interquartile range (Q1–Q3)	31.0–42.0
Years in practice	Mean $\pm$ standard deviation	9.45 $\pm$ 10.3
	Median (min–max)	5.0 (0–50.0)
	Interquartile range (Q1–Q3)	2.0–12.0
Professional status	Established physician	296 (62.8)
	Locum physician	175 (37.2)
Practice location	Urban	175 (37.2)
	Rural	90 (19.1)
	Semi-rural	206 (43.7)
Practice setting	Solo practice	180 (38.2)
	Group practice	291 (61.8)
Average consultation length	10–15 minutes	39 (8.3)
	15–20 minutes	171 (36.3)
	20–30 minutes	223 (47.3)
	> 30 minutes	37 (7.9)
Mental health training	Yes	172 (36.5)
	No	299 (63.5)

Antidepressant Prescribing Practices in General Practice

Selective serotonin reuptake inhibitors (SSRIs) were the most commonly prescribed class (433 physicians, 91.9%), followed by serotonin–norepinephrine reuptake inhibitors (SNRIs) (4.7%), tricyclic antidepressants (0.4%), and anxiolytics (3.0%). The main reasons for mental health consultations were

anxiety (246 physicians, 52.2%), depressive symptoms (24.0%), and sleep disorders (23.8%). The frequency of these consultations was daily for 255 physicians (54.1%) and several times per day for 145 physicians (30.8%). Initiation of antidepressant treatment was reported as weekly (1–2 times per week) by 410 physicians (87.0%). Regarding prescription renewals, 243 physicians (51.6%) reported renewing treatments daily. The time to antidepressant treatment initiation was less than one month in 56.3% of cases (265 physicians), between one and two months for 186 physicians (39.5%), and longer than three months for 20 physicians (4.2%). Finally, the use of clinical guidelines (DSM-5, ICD-10) and standardized assessment scales (such as PHQ-9, GDS, Hamilton) was systematic for 152 physicians (32.3%), frequent for 185 (39.3%), occasional for 102 (21.7%), and absent for 32 (6.8%). Among the 471 physicians surveyed, 382 prescriptions (81.1%) were considered appropriate according to the score based on HAS recommendations, while 89 (18.9%) were considered inappropriate.

Factors Associated with Appropriate Prescribing

Locum physicians accounted for 52.8% ($n = 47$) of the inappropriate prescribing group, compared with 33.5% ($n = 128$) in the appropriate group. This difference was statistically significant ($p = 0.001$), with a lower probability of appropriate prescribing. These results are shown in Table 2.

Among physicians whose prescriptions were considered appropriate, 39.8% ($n = 153$) reported having received mental health training, compared with 21.3% ($n = 19$) in the inappropriate group. Mental health consultations lasting ≥ 20 minutes were significantly more frequent among prescribers whose prescriptions were considered appropriate (57.3% vs 46.1%; $p = 0.034$). Regular use of clinical guidelines and standardized assessment scales was also associated with substantially higher prescribing quality.

Table 2
Baseline Characteristics According to Prescribing Appropriateness Score

Variables	Appropriate prescribing group <i>n</i> (%)	Inappropriate prescribing group <i>n</i> (%)	<i>p</i>	Crude OR (95% CI)	Total <i>n</i> (%)
Sex: Female	288 (75.4)	51 (57.3)	0.001	2.28 (1.41– 3.68)	339 (72.0)
Age (years), mean ± SD	38.9 (11.2)	37.1 (9.7)	0.176	1.02 (0.99– 1.04)	38.5
Years of practice	9.8 (10.5)	8.1 (9.7)	0.158	1.02 (0.99– 1.04)	9.5 (10.4)
Practice status: Locum physician	128 (33.5)	47 (52.8)	0.001	0.45 (0.28– 0.72)	175 (37.2)
Practice location: Non- urban	237 (62.0)	59 (66.3)	0.455	0.83 (0.51– 1.34)	296 (62.8)
Practice setting: Group practice	229 (59.9)	62 (69.7)	0.089	0.65 (0.39– 1.06)	291 (61.8)
Weekly workload ≤ 4 days	277 (72.5)	58 (65.2)	0.169	1.41 (0.86– 2.29)	335 (71.1)
Received mental health training	153 (39.8)	19 (21.3)	0.001	2.46 (1.42– 4.25)	172 (36.5)
Mental health consultations > 20 minutes	219 (57.3)	41 (46.1)	0.034	1.57 (1.04– 2.50)	260 (55.2)
Extended consultation time for antidepressant prescribing	326 (85.3)	72 (80.9)	0.297	1.37 (0.74– 2.46)	398 (84.5)
Frequent mental health consultations	329 (86.1)	71 (79.8)	0.132	1.57 (0.85– 2.81)	400 (84.9)
Frequent initiation of antidepressants	11 (2.9)	10 (11.2)	0.002	0.23 (0.10– 0.58)	21 (4.5)
Frequent renewal of antidepressants	231 (60.4)	55 (61.8)	0.818	0.95 (0.58– 1.51)	286 (60.7)

Variables	Appropriate prescribing group <i>n</i> (%)	Inappropriate prescribing group <i>n</i> (%)	<i>p</i>	Crude OR (95% CI)	Total <i>n</i> (%)
Prescription of alternatives to SSRIs	28 (7.3)	10 (11.2)	0.223	1.60 (0.71–3.33)	38 (8.1)
Initial prescription duration ≥ 1 month	166 (43.5)	40 (44.9)	0.799	0.94 (0.59–1.50)	206 (43.7)
Follow-up interval > 1 month	140 (36.6)	35 (39.3)	0.638	1.12 (0.69–1.79)	175 (37.2)
Regular use of assessment scales	312 (81.7)	25 (28.1)	0.001	11.41 (6.80–19.68)	337 (71.5)

Multivariate Analysis

In the multivariate analysis (Table 3), physicians who reported prescribing antidepressants more readily due to time constraints during short consultation had a markedly increased risk of inappropriate prescribing (adjusted OR [aOR] = 3.661; 95% CI: 1.748–7.604; $p < 0.001$). After adjustment for all other covariates, a positive response to this question increased the adjusted probability of inappropriate prescribing by 22.4% (average marginal effect [AME]; 95% CI: 7.3%–37.6%).

Conversely, having received mental health training was associated with a reduced likelihood of prescribing outside HAS recommendations (aOR = 0.509; 95% CI: 0.274–0.910; $p = 0.02$). Conversely, mental health training (seminars, university diplomas, or CME) was associated with a reduced likelihood of prescribing outside HAS recommendations (aOR = 0.509; 95% CI: 0.274–0.910; $p = 0.02$), reducing its probability by 8.4% (95% CI: 1.4%–15.4%), as defined by questionnaire data.

Table 3

Multivariate Logistic Regression Analysis of Factors Associated with Prescribing Appropriateness

Variables	Adjusted odds ratio (aOR)
Age	
26–34	1 (reference)
35–49	1.341 (0.694–2.632)
≥ 50	0.851 (0.322–2.131)
Sex: Male (reference: female)	1.661 (0.926–2.932)
Time constraints during consultations: yes (reference: no)	3.661 (1.748–7.604)
Professional status: Locum physician (reference: established physician)	1.731 (0.904–3.356)
Mental health training yes (reference: no)	0.509 (0.274–0.910)
Practice setting: Scheduled care center (reference: settings not including scheduled care centers)	2.353 (0.918–5.902)
Frequency of treatment initiation : daily or several times per day? (reference: lower frequency)	1.889 (0.608–5.656)
Average time spent with patient presenting depressive or anxiety symptoms	
> 20 minutes	1 (reference)
15–20 minutes	0.900 (0.506–1.574)
< 15 minutes	1.963 (0.842–4.380)
Patient request (stress and social isolation) yes (reference: other situation)	1.116 (0.643–1.925)
Insistent patient requests without clear diagnosis: sometimes/frequently (reference: rarely/never)	1.572 (0.824–2.937)
a Global p value for the variable. Area under the curve (AUC): 0.698. Pseudo- R^2 (Nagelkerke): 0.194. Hosmer–Lemeshow goodness-of-fit test: $p = 0.18$ (no evidence of poor calibration).	

Obstacles and Professional Perceptions According to Prescribing Appropriateness Score

Among the reasons for immediate antidepressant prescribing, several contextual factors were significantly more frequent in the inappropriate prescribing group. These included lack of access to complete medical records (1.0% vs 15.7%; $p = 0.001$), lack of familiarity with the patient (1.8% vs 14.6%; $p = 0.001$), and absence of an established physician–patient relationship (1.6% vs 12.4%; $p = 0.001$) (Appendix 2, Table S2). Time constraints during the consultation (3.1% vs 19.1%; $p = 0.001$) and patient pressure to obtain an antidepressant prescription (7.6% vs 27.0%; $p = 0.001$) were also more frequently

reported by physicians in the inappropriate group / in the inappropriate prescribing group. Conversely, the presence of a severe depressive episode as a reason for immediate prescribing was more frequently reported in the appropriate prescribing group (93.3% vs 97.9%; $p = 0.048$).

Regarding reasons limiting antidepressant prescribing, certain factors were reported more frequently in the inappropriate group. Difficulty managing the dose was reported as a constraint by 7.1% in the appropriate group, compared with 14.6% of prescribers in the inappropriate group ($p = 0.022$).

With respect to the main challenges encountered when prescribing antidepressants, difficulty identifying a clear diagnosis was more frequently reported by prescribers in the inappropriate group (26.4% vs 41.6%; $p = 0.005$). By contrast, difficulty finding an appropriate dose was more frequently reported in the appropriate group (9.0% vs 25.7%; $p = 0.001$), as shown in Appendix 2, Table S2.

Finally, certain patient requests were more frequently reported in the inappropriate group, “stress and social isolation” was cited in 58.4% of cases in the inappropriate group, compared with 43.2% in the appropriate group ($p = 0.009$). Insistent requests for antidepressant prescribing without a clear diagnosis were significantly more frequent in the inappropriate prescribing group than in the appropriate group (29.2% vs 15.4% ; $p = 0.002$), suggesting that this type of contextual pressure was associated with a lower likelihood of appropriate prescribing (OR = 0.44; 95% CI: 0.26–0.76).

Physician Self-Assessment According to Prescribing Appropriateness Score

Using a self-evaluation scale, was significantly higher in the appropriate prescribing group. Specifically, 95.5% of physicians in this group reported a score ≥ 3 out of 5, compared with 87.6% in the inappropriate group ($p = 0.01$), as shown in Appendix 2, Table S3. Lack of confidence in diagnosing depression was significantly more frequent in the inappropriate prescribing group (20.2% vs 2.4%; $p = 0.001$).

DISCUSSION

Time constraints were the main factor associated with prescribing antidepressants outside HAS recommendations. However, having received mental health training (seminars, university diplomas, CME) appeared to be an independent protective factor. These findings support the need to strengthen mental health training.

Our results highlight that factors associated with appropriate, recommendation-based prescribing include mental health training, perceived competence in this field, regular use of clinical guidelines and standardized assessment tools, and established physician status. Other significant factors included female gender, longer consultation duration, greater consideration of patients’ clinical characteristics, moderate frequency of treatment initiation, greater ease in clinical management, absence of contextual pressures such as time constraints, patient pressure, or the lack of an established therapeutic relationship.

In the univariate analysis, our results suggested a significant impact of practice status on the quality of antidepressant prescribing. However, this association did not persist after adjustment, precluding the independent attribution of inappropriate prescribing to locum practice. Nevertheless, these findings should be interpreted in light of existing literature. Braka-Cohen [20] highlighted specific characteristics of this population, including a predominance of women, highly variable practice durations, frequently solitary working conditions, and limited or partial access to structured CME. In addition, these physicians do not always have full access to medical records, practice in diverse geographic and organizational settings, and may lack sufficient time to explore complex clinical situations, particularly those related to mental health. This intermittent mode of practice differs fundamentally from that of established physicians, who provide regular patient follow-up, maintain stronger therapeutic relationships, and are better integrated into collective dynamics, whether within teams or local healthcare networks. By contrast, locum physicians often work independently, in less structured environments, and without access to equivalent resources. Since the 2019 decree, their access to funding for CPD has been withdrawn [14], further limiting their access to education, particularly in the field of mental health.

The mean age of participants was 38.5 years, and most were women (72.0%). These characteristics differ from nationwide [21], which indicate a mean age of 49.3 years and a more balanced sex distribution (50% women). In addition, 291 physicians in our sample (61.8%) practiced in group settings, a proportion much higher than that observed nationally, where only 38% of physicians work in group practices compared with 62% in solo practice. This overrepresentation of coordinated practice may reflect a greater presence of younger physicians in our sample, who may be more attracted to this type of practice. The mean practice duration of 9.45 years further supports the relatively young and less experienced profile of the study population. Moreover, locum physicians accounted for 37.2% of our sample, more than double the national proportion estimated at 16.6% in 2025 [9]. This discrepancy may be explained by participation bias, as locum physicians are generally younger, more available, and potentially more inclined to respond to an online questionnaire (Appendix 1).

These results are also consistent with trends observed in other countries. In the United Kingdom, a large study by Grigoroglou et al. (2024) showed that locum GPs were 21% more likely to prescribe antibiotics than established physicians (OR = 1.22; 95% CI: 1.20–1.22; $p < 0.001$) and 8% more likely to prescribe strong opioids (OR = 1.08; 95% CI: 1.06–1.09) [17]. These prescriptions, sometimes outside recommendations, reflect less cautious prescribing behavior among locum physicians, particularly in acute or poorly documented clinical situations, as observed in our study, which may present acutely and require rapid management. In Sweden, the study by Tell et al. (2015) compared adherence to prescribing guidelines for respiratory tract infections. Locum physicians ranked last, behind interns and early-career established physicians, in terms of compliance with recommendations. The greatest discrepancy concerned acute bronchitis, for which locum physicians had the highest rate of inappropriate prescribing [22]. These findings converge with our own suggesting that across several national contexts, locum status is associated with lower adherence to clinical guidelines, regardless of the therapeutic class studied. This recurring pattern likely reflects shared mechanisms, including incomplete knowledge of the patient, increased time pressure, lack of continuity of care, and incomplete physician–patient

relationship. By contrast, established physicians benefiting from, longitudinal follow-up, organizational frameworks, and sometimes practice-level protocols, are better positioned to apply recommendations comprehensively.

Overall, our study provides national confirmation of a phenomenon observed internationally: while locum practice remains essential to the functioning of primary care, it requires particular attention regarding training, supervision, and integration into decision-support tools to reduce practice variation.

The multivariate analysis showed that associations identified in the bivariate analyses persisted after adjustment for major confounding factors. After adjustment for age, sex, and other contextual variables, two factors emerged as independent determinants: mental health training and time constraints during consultations.

The protective effect of training highlights that even limited training (university diploma, seminar, CME) translates into a measurable improvement in prescribing quality. This observation is consistent with international literature in which specific mental health training has been associated with better recognition of MDEs and reduced inappropriate antidepressant prescribing. Conversely, time constraints during consultations, frequently reported by physicians as a barrier to comprehensive care, emerged here as a major structural determinant. This factor extends beyond individual responsibility and reflects healthcare organization, physician density, and workload in general practice. The link between time constraints and inappropriate prescribing has already been described in studies on antibiotic and anxiolytic overprescribing. The multivariate analysis therefore highlights a tension between training and practice conditions: on the one hand, continuing education acts as a lever for improving practices; on the other, persistent time and organizational constraints remain obstacles to guideline adherence. These educational and structural levers should therefore be considered jointly in quality-of-care improvement policies.

In our study, a significant association was observed between mental health training and appropriate antidepressant prescribing. This finding highlights the weakness of initial psychiatric training among French GPs. Clinical placements in psychiatry remain limited and poorly aligned with the realities of ambulatory practice [12]. As shown by Fovet et al. (2014), there is substantial variability between medical schools, and future GPs report feeling insufficiently prepared to manage mental health disorders [12]. Nevertheless mental health occupies an increasingly central place in general practice activity, particularly for anxiety and depressive disorders. In France, according to Kovess-Masféty et al., GPs are the first point of contact for 57.8% of patients with mental health disorders [4]. Continuing medical education still appears insufficient to meet the needs of GPs in this field. The state of continuing medical education is poor with no application of a defined training strategy [12]. This deficit was particularly pronounced among early-career physicians and locum practitioners, who were largely dissatisfied with their professional development, citing time constraints (87.3%) and the absence of structured programs as the main barriers. These findings echo longstanding concerns about the limited availability and insufficient specificity of continuing mental health education, despite the implementation of CPD [12].

Beyond the objective content of training, our results also show that subjective perception of sufficient competence in mental health was associated with more appropriate prescribing. This perception likely reflects greater confidence in clinical assessment, diagnostic reasoning, and therapeutic follow-up. These findings are consistent with those of Pillai et al. (2021) in India, who studied 2,796 primary care patients. In that study, 31.1% of antidepressant prescriptions concerned patients who did not meet criteria for a MDE, while nearly half of patients with a confirmed diagnosis (48.8%) discontinued treatment before six weeks [6]. These inappropriate practices were significantly more frequent among physicians without mental health training (OR = 2.9; 95% CI: 2.1–4.0; $p < 0.001$). Lack of training was also associated with lower use of standardized assessment tools (PHQ-9; $p < 0.001$). Briffault et al. (2010) showed, in a French study of 334 GPs, that 64% reported receiving no practical mental health training during their studies, and 59% had not attended any psychiatric CME in the previous 5 years [10]. In addition, 37% reported being unfamiliar with HAS recommendations, and 48% felt they lacked sufficient skills to diagnose an MDE. These comparisons highlight the persistent gap between recommendations and practice, particularly regarding initial and continuing training. They support our findings by suggesting that even limited investment in mental health training could be a simple and effective lever for improving primary-care practice.

National and international data converge toward a shared conclusion: the absence of structured training, whether initial or continuing, has a direct impact on prescribing quality in mental health. In a context where anxiety and depressive disorders account for a growing proportion of general practice consultations, these findings call for strengthening medical training in mental health. Mandatory structuring of psychiatric education during medical studies, targeted and interactive CPD programs, and wider dissemination of validated clinical tools such as severity scales could significantly improve the quality of mental health services in primary care.

Other factors were also associated with appropriate antidepressant prescribing. Female gender was significantly associated with more appropriate prescribing, suggesting greater adherence to treatment recommendations for depression among female physicians. This finding is partly consistent with the results of Jufresa-Blanch et al. [23], who reported that female physicians prescribe fewer antidepressants overall, possibly reflecting a more cautious and reasoned approach. Although their study did not directly assess appropriateness, our data suggest that this tendency toward more restrained prescribing is associated with better quality rather than under-treatment.

Consultation duration also appeared to play a significant role. In our study, consultations lasting more than 20 minutes were significantly associated with more appropriate prescribing. However, only 7.9% of physicians reported consultations longer than 30 minutes, while 83.6% reported durations between 15 and 30 minutes. These figures are consistent with a study reporting a mean consultation duration of 16 minutes in 2021 [20]. This finding highlights a mismatch between available medical time and expected prescribing quality. Extending consultation time could represent an opportunity for improvement, although it remains difficult to implement given the current workload and workforce constraints.

Several organizational constraints were associated with lower appropriateness rates, including lack of access to medical records, unfamiliarity with the patient, absence of a therapeutic relationship, and insufficient consultation time. Other relational and emotional factors, such as perceived patient pressure or insistent requests for prescriptions without a clear diagnosis, were also associated with reduced appropriateness. These clinically tense situations, previously described in the literature, notably in the doctoral thesis by Barré-Detrimont (2013) [24], underscore the vulnerability of clinical judgment when physicians work in isolation or under time constraints.

From a clinical perspective, lack of diagnostic confidence, difficulty establishing a clear diagnosis, or difficulty determining the appropriate dose were also associated with lower prescribing appropriateness. Conversely, physicians reporting greater ease in initiating treatment or adjusting dosage demonstrated higher levels of appropriateness. In addition, certain reasons for consultation, such as stress or social isolation, were also associated with lower appropriateness rates. These findings highlight the combined influence of contextual, emotional, and technical factors on prescribing appropriateness and underscore the need for further qualitative research to better understand decision-making processes in general practice.

This study addresses a topic that remains underrepresented in the literature and is based on several hundred responses collected nationwide from physicians with diverse practice profiles. However, it has limitations. First, the survey design likely generated selection bias, as only the most engaged practitioners may have responded. Second, self-reported study exposed to classification bias, as some respondents may have overestimated the quality of their practices or minimized the difficulties they encountered. In addition, the appropriateness indicator was based on four self-assessed subjective criteria, without external validation or clinical verification. Third, regular locum physicians who provide extended follow-up may blur the line between locum and established practices. Finally, residual confounding may not have been fully accounted for in the analysis.

The findings of this study suggest several avenues for reflection and intervention. They first highlight the importance of reintegrating locum physicians into the CME system, from which they have been excluded since the 2019 decree, in order to reduce training disparities and improve prescribing quality. Introducing at least one mandatory mental health semester into the general practice residency curriculum, including placements in ambulatory psychiatry and primary care facilities, would also be warranted. Establishing structured links between general practice and psychiatry (joint consultations, structured communication, and facilitated access to specialists) could further enhance the quality of care. Beyond training, this study draws attention to regarding societal determinants of depression, particularly among younger populations, including social isolation, social media exposure, academic pressure, job insecurity, substance use, and chronic illnesses such as cancer. A comprehensive public-health approach will be required to address these underlying determinants. Finally, qualitative research would be valuable to explore patient experiences when receiving care from locum physicians for anxiety-depressive symptoms, and to better understand the ethical dilemmas faced by physicians confronted with insistent treatment requests from patients without a clear diagnosis.

CONCLUSION

This quantitative study conducted among 471 GPs confirms that the quality of antidepressant prescribing depends both on physician's training and actual practice conditions, calling for action on both training and organizational fronts to improve mental health management in primary care. It also underscores the importance of conducting further qualitative studies focused on the experiences of locum physicians and patients, to better understand the subjective and organizational factors that influence prescribing in primary care. These insights could inform the development of targeted recommendations and to the improvement of clinical practice.

Abbreviations

CDOM: Departmental Council of the French Medical Council (*Conseil départemental de l'Ordre des médecins*)

CI: Confidence Interval

CME: Continuing Medical Education

CNOM: National Council of the French Medical Council (*Conseil national de l'Ordre des médecins*)

CPD: Continuing Professional Development

CPP: Research Ethics Committee (*Comité de Protection des Personnes*)

DES: Postgraduate Specialty Diploma (*Diplôme d'Études Spécialisées*)

DREES: French Directorate for Research, Studies, Evaluation, and Statistics (*Direction de la recherche, des études, de l'évaluation et des statistiques*)

DSM: Diagnostic and Statistical Manual of Mental Disorders

GDS : Geriatric Depression Scale

GP: General Practitioner

HAS: French National Authority for Health (*Haute Autorité de Santé*)

ICD: International Classification of Diseases

MDE: Major Depressive Episode

PHQ-9: Patient Health Questionnaire-9

SNRI: Serotonin–Norepinephrine Reuptake Inhibitor

SSRI: Selective Serotonin Reuptake Inhibitor

URPS: Regional Unions of Healthcare Professionals (*Unions régionales des professionnels de santé*)

WHO: World Health Organization

Declarations

Ethics approval and consent to participate

This study did not fall within the scope of the French Jardé Law, as it involved neither human participant intervention nor the collection of sensitive health data. No personal data were processed, thereby ensuring full anonymity for the participants. As the survey was strictly declarative and observational, no approval from an ethics committee (*Comité de Protection des Personnes*) or authorization from the French Data Protection Authority (*Commission Nationale de l'Informatique et des Libertés*) was required.

Consent for publication

Not applicable

Availability of data and materials

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials. The data that support the findings of this study are available from the corresponding author, SS, upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

No funding.

Author contributions

SS and WB designed the study. WB collected the data. Formal analysis was performed by SS and JC. WB and SS wrote the first draft of the manuscript. WB, SS, AS, JC, CLK revised the manuscript. All authors have read and approved the final manuscript for publication.

Acknowledgements

The authors would like to thank Vicki Fanney and Constance Baverel for their support in proofreading the manuscript.

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