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Prevalence and management of chronic insomnia in Swiss primary care: Cross-sectional data from the Sentinella practice-based research network

Running title: Chronic insomnia in Swiss primary care

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Summary

We investigated the prevalence and treatment of patients with chronic insomnia presenting to Swiss primary care physicians (PCPs) part of “Sentinella”, a nationwide practice-based research network. Each PCP consecutively asked 40 patients if they had sleep complaints, documented frequency, duration, comorbidities, and reported ongoing treatment. We analyzed data of 63% (83/132) of the PCPs invited. PCPs asked 74% (2432/3216) of included patients about their sleep (51% female); 31% (761/2432) of these had had insomnia symptoms; 36% (875/2432) had current insomnia symptoms; 11% (269/2432) met DSM-5 criteria for chronic insomnia (61% female). 75% (201/269) of patients with chronic insomnia had comorbidities, with 49% (99/201) reporting depression. Chronic insomnia was treated in 78% (209/269), 70% (188/268) took medication, 38% (102/268) benzodiazepines or benzodiazepine receptor agonists; 32% (86/268) took antidepressants. Only 1% (3/268) had been treated with CBT-I.

A third of patients presenting for a non-urgent visit in Swiss primary care reported insomnia symptoms. 11% met DSM-5 criteria for chronic insomnia. Hypnotics were the most common treatment, but almost no patients received first-line CBT-I. Reducing the burden of insomnia depends on disseminating knowledge about and access to CBT-I, and encouraging PCPs to discuss it with and offer it as a first-line treatment to patients with chronic insomnia.

Keywords: Chronic insomnia, primary care, cognitive behavioral therapy for insomnia, sleep, epidemiology

Introduction

Almost a third of the general population suffers from insomnia symptoms, and about 10% of these have chronic insomnia disorder (Baglioni et al., 2019; Ohayon, 2002), posing a serious public health problem. Even brief bouts of insomnia can increase irritability and accident risk and decrease cognitive performance (Leger et al., 2014; Leger, Partinen, Hirshkowitz, Chokroverty, Touchette, et al., 2010). Chronic insomnia is an independent risk factor for depression (Baglioni et al., 2011) and cardiometabolic disorders (Li et al., 2014); and may significantly raise stroke risk, especially in younger adults (Zheng et al., 2019). People with insomnia are more likely to visit doctors (Novak et al., 2004); in the U.S., aggregate costs for insomnia were estimated to up to $100 billion per year (Wickwire et al., 2016).

DSM-5 defines chronic insomnia as subjective sleep disturbance at least 3 nights/week for over 3 months, with concomitant daytime impairment (Association, 2013). Traditionally, insomnia was often considered secondary to other conditions, like depression and anxiety, but these views have changed considerably in the last decade. It is now considered a distinct condition (Riemann et al., 2017) that requires targeted treatment even when co-occuring.

First line treatment for insomnia is cognitive behavioral therapy for insomnia (CBT-I) because of better long-term results and fewer adverse effects than pharmacological treatment (Qaseem et al., 2016; Riemann et al., 2017). CBT-I is a multi-component approach including sleep hygiene, stimulus control, sleep restriction, relaxation, and other cognitive techniques. It has been found effective if delivered face-to-face, in group settings, online, and even through self-help-books (Brasure et al., 2016). Not only patients with newly diagnosed chronic insomnia should be offered CBT-I, but also patients already taking hypnotics could profit of CBT-I when trying to deprescribe (Hintze & Edinger, 2018). Despite documented effectiveness of CBT-I, studies from other countries reveal that primary care physicians

(PCPs), who often manage chronic insomnia, predominantly prescribe drugs (Koffel et al., 2018; Medalie & Cifu, 2017; Ulmer et al., 2017). The scarcity of CBTI-I referrals suggests that physicians are unaware of this effective and safe treatment, an argument supported by findings from a survey we sent to 395 Swiss PCPs (Linder et al., in prep.), where most PCPs knew little about CBT-I and 78% did not know a provider.

PCPs usually prescribe the hypnotic aids benzodiazepines (BZD) and benzodiazepine receptor agonists (BZRA) (Agarwal & Landon, 2019). Caution is required when prescribing these agents for insomnia, because poor sleep quality in particular predicts conversion to long-term use for BZD (Gerlach et al., 2018) and 20% of those who take hypnotics (especially BZRA) will become long-term users (Schonmann et al., 2018). Overall prescription rates for BZD and BZRA for insomnia have not diminished—they have instead increased and shifted towards BZRA (Agarwal & Landon, 2019; Hughes et al., 2016). Sedating antidepressants such as trazodone are also increasingly prescribed for insomnia (Bertisch et al., 2014; Lai et al., 2011) despite recommendations against their long-term use (Qaseem et al., 2016; Riemann et al., 2017). Even in comorbid depression, CBT-I is a better option to treat insomnia and depressive symptoms than antidepressants alone, and can significantly improve depressive symptoms in parallel (Baglioni et al., 2011; Wu et al., 2015). In an insomnia case vignette survey among 395 Swiss PCPs (Linder et al., in prep.), the majority said they would prescribe phytopharmaceuticals as a starting point. Phytopharmaceuticals are however not recommended to treat insomnia due to a lack of efficacy (Qaseem et al., 2016; Riemann et al., 2017).

While these findings suggest that evidence-based insomnia treatment has yet to find its way into primary care, limited data is available regarding DSM-5 chronic insomnia prevalence linked to specific treatment in this setting. We thus set out to estimate the

prevalence of adult patients with insomnia symptoms who visited a representative sample of Swiss PCPs for a regular consultation and determined 1) the proportion of patients who met criteria for DSM-5 chronic insomnia and 2) the pharmacological and non-pharmacological treatments prescribed.

Methods

Study setting and design

Our cross-sectional study in Swiss primary care practices was part of the Swiss Sentinella Surveillance network, a project of the Federal Office of Public Health (FOPH) in 2018. General practitioners, internists, and pediatricians in private practices voluntarily collect irreversibly anonymized morbidity data each week during regular consultations. We excluded pediatricians and invited the remaining 132 PCPs to participate. PCPs used the same paper data collection form as in previous studies in the Sentinella network, designed to fit the routine and schedule of PCPs (Braun et al., 2019). The questions on the form were based on the DSM-5 criteria (Association, 2013) for chronic insomnia.

The local ethics committee (Canton Bern, Switzerland) waived ethical approval for earlier studies we conducted in Sentinella (Braun et al., 2019) because the double irreversible patient-data anonymization process protected participants (FOPH cannot identify patients, investigators cannot identify PCPs). Thus, the study fell outside the scope of the Swiss Human Research Act.

Data collection form: Development and distribution

We worked with insomnia specialists, PCPs and experts in public health and epidemiology to adapt the content of the data collection form and sought feedback from the Sentinella

board. One PCP piloted the form in his practice and we then adapted it based on his feedback. To standardize data collection, we supplied PCPs with a one-page summary and a detailed study description accompanied by instructions and suggested wording for questions directed at patients. All documents were provided in German and French. The FOPH distributed the documents to participating primary care practices in May 2018. PCPs could choose their start date but were encouraged to begin collecting data as soon as possible. PCPs could include each first patient per half day of work or the first two patients per half day of work excluding urgent consultations. We asked them to choose the approach they would take to data collection and not to deviate from it. If they forgot to collect data on a half day, we asked them to continue the next half day, until they reached 40 patients. We limited the number of patients to 40 to fit the tight schedule of PCPs and to collect data within a limited time window so we could maximize PCP response rate. We already showed feasibility of this approach in the Sentinella network (Braun et al., 2019).

In the Sentinella network, the geographic distribution of PCPs is representative of the Swiss population. Practice location (urban, intermediate, or rural) was defined by the size, population density, and accessibility criteria of the Federal Statistics Office (2017); all data were anonymized and provided by the FOPH. The number of PCPs regularly participating in Sentinella varies, ranging from 148 to 175 in 2018. PCPs are reimbursed for their participation in the Sentinella data collection by the FOPH. If multiple PCPs in a single practice reported to Sentinella, we asked that only one PCP collect data. One reminder was sent to non-responders in July 2018; data collection ended in October 2018. The FOPH collected all data forms and transferred them to us, ensuring double anonymization.

Measures and outcomes

The FOPH provided anonymized demographic data about PCPs (age; sex; practice location: urban, intermediate, rural). PCPs were instructed to systematically include 40 consecutive adult patients (>18 y) seen for a non-urgent consultation. PCPs were to follow a strict algorithm (Supplementary Fig. 1). On the first part of the data collection form, they documented patient data (sex: male/female; age; previous insomnia complaints by patient report/chart review). PCPs could choose not to discuss sleep with a patient (e.g., if the consultation was inappropriate); likewise, patients could refuse participation. In either case, PCPs filled in the first part of the form. The second part assessed insomnia complaints (none, current, in remission under ongoing treatment). If patients had current sleep complaints, they were asked how long the problem endured (<3 months; ≥3 months), how frequent it was (<3 nights/week; ≥3 nights/week), how symptoms manifested (difficulty falling asleep; fragmented sleep; early awakening; non-restorative sleep), and if they had daytime impairment (yes/no) defined as significant subjective impact of sleep complaints on daytime functioning in personal, professional or social life. Next, PCPs noted whether the patient had an adequate opportunity to sleep (yes/no to self- or other-imposed sleep time restrictions or disturbances). Last, PCPs assessed most frequent insomnia comorbidities (sleep apnea; restless legs syndrome; medication/drug abuse; anxiety; depression; and chronic pain) (Riemann et al., 2017). In the third part of the form, PCPs documented treatment including use of BZD, BZRA, antidepressants, neuroleptics, antihistamines, and phytopharmaceuticals. We did not ask PCPs to document subclasses. If a patient took BZD or BZRA, PCPs noted duration (<1 month, ≥1 month) and dose frequency (daily; several times/week; as needed). Then PCPs recorded non-pharmacological treatments (sleep hygiene; CBT-I; other psychotherapy; other). PCPs could write down multiple answers for insomnia type,

comorbidity, and medication. For patients in remission, PCPs only filled in the third part of the form.

Criteria for chronic insomnia conformed to DSM-5: subjective sleep complaints three or more nights per week for three or more months with significant daytime impairment despite adequate sleep opportunities (Association, 2013). If the patient met all these criteria, we classified them as suffering from chronic insomnia in our analyses. If sleep complaints were present but one of the DSM-5 criteria was not met, we classed the patient as having insomnia symptoms.

Our predictors were PCP and patient characteristics (including former insomnia symptoms); our primary outcomes were current sleep complaints (insomnia symptoms), chronic insomnia, and type of insomnia treatment. Secondary outcomes were comorbidities, insomnia type, and treatment duration.

Statistical methods

We characterized the sample of PCPs and patients with descriptive statistics. Proportions in age categories and sex across groups were evaluated with Pearson Chi^2. We calculated overall proportions of all included patients—those asked about sleep by their PCP who told they a) had sleep complaints, b) met criteria for chronic insomnia or c) were in remission under ongoing treatment, d) had had insomnia complaints in the past but were in full remission without ongoing treatment, or e) never had insomnia complaints. We then calculated proportions of patients treated for chronic insomnia, and for type of treatment for a) patients with chronic insomnia and b) in remission under treatment.

To cluster by PCP, we used multivariate mixed-effects logistic regression models that measured the association between patient characteristics, PCP demographics, and proportions of patients of each group. We modeled a random effect for PCP, and fixed effects for patient (age, sex, previous insomnia symptoms) and PCP level predictors (age groups: 30–39, 40–49, 50–59 and > 60 years, sex, practice location: urban, intermediate, rural). Then we measured the association between patient characteristics (age, sex, previous insomnia diagnosis, presence of comorbidity) and treatment with logistic regression models.

We did not use specific statistical methods to impute missing data. We conducted all analyses with Stata version 15.1 (StataCorp LP, College Station, TX, USA).

Results

Fig. 1 shows the study flow chart of PCP and patient inclusion.

[Insert Figure 1]

PCP characteristics

Of 132 PCPs invited, 88 joined the study (66%). We excluded two PCPs due to non-adherence to inclusion criteria (repeatedly including patients <18 years), two PCPs because they filled out the data form incorrectly, and one PCP who stopped collecting data after 6 patients because he was too busy. We included the remaining 83 PCP (63%) in data analysis. We report sociodemographic characteristics of PCPs in Supplemental Table 1**.** Most PCPs (77%, n=64) collected data on the two first patients each half day, and less than a quarter (22%, n=18) collected data on the first patient each half day. One PCP did not indicate the method used (1%).

Patient characteristics

Of a potential dataset of 3320 patients (40 patients x 83 PCPs), we were able to analyze data of 3216 (96%). Four PCPs only gathered data on 20 patients and we excluded 20 patients under 18y and four patients over 100y. PCPs discussed sleep with 2432/3216 of the remaining eligible patients (76%). They did not discuss sleep with 784 patients (24%), because they decided not to (82%, n=644/784), had already collected the patient's data in a previous consultation (9%, n=67/784), or the patient did not want to participate (9%, n=73/784). Age group and sex proportions across patients where sleep was or was not discussed were similar (sex: Pearson Chi^2 (1) = 1.04; p = 0.4; age groups: Pearson Chi^2 (3) = 6.5, p = 0.09). We report patient characteristics in Table 1**.** In multivariate adjusted analyses, patients with known insomnia symptoms were more likely to be asked about sleep (OR=3.8, 95% CI=2.8-5.3, p < 0.001). Patient age, sex, and physician-level predictors were not associated with discussion of sleep (all p > 0.05).

[Insert Table 1]

Subjective sleep disturbance (insomnia symptoms)

Of the included 2432 patients, PCPs already knew that 31% (n=761/2432) had had insomnia symptoms at some point. Over a third of patients reported current symptoms (36%, n=875/2432; 56% women) (Fig. 2, Table 1), of these, the PCP was aware of previous complaints in 61% (n=535/875). A fraction of patients without current insomnia symptoms (6%, n= 133/2432) were under ongoing treatment ("in remission under treatment"); 4% (n=107/2432) had had symptoms but were in full remission and untreated. Close to half of the patients asked (46%, n=1115/2432) had had insomnia symptoms at some point (Fig. 2). Previous insomnia symptoms were a significant predictor of current insomnia symptoms

(OR=10.8, 95% CI=8.6-13.7, p < 0.001). No patient or PCP predictors were significant (all p > 0.05).

Chronic insomnia according to DSM-5

A total of 269/2432 patients met DSM-5 criteria for chronic insomnia (11% of all patients asked, 61% women). Thus, a third (31%, n = 269/875) of the patients presenting with symptoms met DSM-5 criteria for chronic insomnia (Fig. 2, Table 1). We summarize the distribution of insomnia types in Supplementary Table 2 and describe comorbidities in Table 2 and Supplementary Fig. 2. Chronic insomnia was significantly associated with previous insomnia symptoms (OR=3.0, 95% CI=2-4.4, p=0.00) and women were more likely to have chronic insomnia (OR=1.4, 95% CI=1-1.9, p=0.048). No other predictors were significant (all p > 0.05).

[Insert Figure 2]

[Insert Table 2]

Treatment of patients with chronic insomnia

Most patients with chronic insomnia were treated (78%, n=209/268), see Figure 3. Data for one patient was missing. Most were prescribed medication (70%, n=188/268). Fig. 3 shows distribution of pharmacological treatment: 38% (n= 102/268) took BZD or BZRA (BZD: 23%, n=63/268; BZRA: 18%, n=48/268); 79% of took them for over a month (n=81/102); 78% for several nights/week to daily (n=80/102). Two-thirds of the patients took these medications several nights/week to daily for over four weeks (66%, n=67/102) (Fig. 4). Antidepressants were prescribed to 32% (n=86/268).

Fig. 3 shows non-pharmacological treatments: 12% received treatments not on our list (n=33/268); 11.5% followed sleep hygiene advice (n=31/268), and, 11% were in

psychotherapy (n=30/268). Three patients with chronic insomnia (n=3/268) had gone through CBT-I (1%).

Previous insomnia symptoms were a significant predictor for pharmacological treatment (OR 2.9, 95% CI 1.5-5.5, p=0.002) and BZD/BZRA intake (OR 2.2, 95% CI 1.1-4.4, p=0.029). Women and older patients were more likely to have had pharmacological treatment (women OR 2.4, 95% CI=1.3-4.4, p=0.004; age group 66-100 y, OR=4.1, 95% CI=1.5-11.3, p=0.005, reference group: 18-35 y). Older age was also associated with BZD/BZRA-use (age group 66-100y, OR=5.8, 95% CI=1.8-18.8, p=0.003, reference group: 18-35y).

[Insert Figure 3 and 4]

Treatment of patients in remission under ongoing treatment

We had data on treatment type for 132/133 patients in remission. About half (51%) took BZD or BZRA (n=67/132) (33% BZD (n=44/132); 21% BZRA (n=28/132)). A large majority (90%; n=60/67) took BZD or BZRA for over 4 weeks, 88% daily or several nights/week (n=59/67), and 80% daily or several nights/week for over 4 weeks (n=54/67); 26% took antidepressants (n=35/132), 11% took phytopharmaceuticals (n=15/132), 9% took other medication (n=12/132), 5% neuroleptics (n=6/132), and 3% antihistamines (n= 4/132). Most (77%) patients taking BZD or BZRA were older than 66y. Most (61%, n=80/132) received no non-pharmacological treatment; 15% practiced sleep hygiene (n= 20/132); 13% were treated with other psychotherapy (n=17/132), 10% were treated with other methods that were not on our list (n=14/132), and one patient was prescribed CBT-I (<1%).

Discussion

More than a third of 2432 adult patients who visited the participating PCPs in the Swiss Sentinella network in 2018 had subjective sleep complaints. Among the 11% who met DSM-5 criteria for chronic insomnia, women were overrepresented (61%). Most (70%) of patients with chronic insomnia took medication, most commonly BZD and BZRA, which were taken by more than a third of all patients (38%). BZD/BZRA use was associated with older age; chronic consumption was common. CBT-I, first-line treatment for chronic insomnia according to guidelines, was drastically underprescribed (1%).

Our data reveal the high prevalence of insomnia symptoms in Swiss primary care, comparable to studies conducted in other countries (Bjorvatn et al., 2017; Leger, Partinen, Hirshkowitz, Chokroverty, Hedner, et al., 2010). Prevalence for chronic insomnia in other studies in primary care varied, depending on diagnostics applied (Riemann et al., 2017), but could be as high as 50% based on DSM-4 criteria (Bjorvatn et al., 2017; Leger, Partinen, Hirshkowitz, Chokroverty, Hedner, et al., 2010; Wittchen et al., 2001). We used DSM-5 criteria, which are stricter for duration (3+ months). DSM-4 and ICD-10 criteria are 4+ weeks. This may explain the lower prevalence (11%) that we identified. There is a scarcity of cross-sectional data for chronic insomnia in Europe based on DSM-5 criteria (Riemann et al., 2017), so we look forward to new research that will allow us to better contextualize our findings.

Over 70% of chronic insomnia patients, whether treated or in remission, took medication —up to half were prescribed BZD or BZRA and took it daily or several times a week for over a month, matching results of studies in other countries (Bjorvatn et al., 2017; Pillai et al., 2017; van Rijswijk et al., 2007). The older a patient was, the more likely they took medication, even though several medical societies recommend against prescribing BZD or

BZRA long term (By the American Geriatrics Society Beers Criteria Update Expert, 2019). This finding similar to studies in other countries (Bjorvatn et al., 2017; Maust et al., 2016; Olfson et al., 2015). The high number of patients who received antidepressants against insomnia symptoms in our data set (32 %) aligns with previous studies that showed this off-label treatment is increasing (Bertisch et al., 2014; Lai et al., 2011; Walsh & Schweitzer, 1999). Despite the many PCPs who indicated in clinical vignettes they would use phytopharmaceuticals to treat insomnia (Linder et al., in prep.), we found only a small fraction of patients took them (10%). This difference between theory and practice might indicate that PCPs perhaps first prescribe phytopharmaceuticals first, and this could prime patients to take a pill against sleep complaints. Because these agents are often ineffective, patients might ask for stronger agents and end up with a prescription for BZD, BZRA or antidepressants. PCPs should take note of this potential escalation and discuss non-pharmacological options early on.

Only three people with chronic insomnia and one person in remission were treated with CBT-I, demonstrating drastic underuse of this effective first-line treatment, even though both online and face-to-face CBT-I are covered by mandatory health insurance if prescribed by a medical doctor in Switzerland. One explanation is a lack of knowledge about CBT-I, supported by Linder et al. (in prep.), found most Swiss PCPs knew little about CBT-I and knew no providers. Their busy schedules and the complex histories of their patients might make them reluctant to recommend non-pharmacological treatment. As Moloney et al. noted, “sometimes, it’s easier to write the prescription” than to take time to discuss sleep (Moloney, 2017). PCPs also often feel pressured to prescribe hypnotics (Linder et al., in prep, (Everitt et al., 2014; Hughes et al., 2016)). The patient’s lack of familiarity with CBT-I or their sense that mental health care is stigmatized could also reduce CBT-I use. Future researchers

may want to test interventions that address PCPs' and patients' lack of knowledge about CBT-I and providers , since this may reduce barriers to CBT-I implementation (Koffel et al., 2018) and starting points for interventions.

To address the dissemination gap in non-pharmacological treatment for chronic insomnia in primary care, we may need to change the minds of both patients and physicians. Courses or workshops on CBT-I could improve PCP knowledge of evidence-based insomnia care (Baglioni et al., 2019), and encourage PCPs to discuss this therapeutic option with patients. Decision aids could encourage informed decision-making and empower patient. Actively linking PCPs with specialists who offer CBT-I by creating a national register might also increase referrals.

The busy routines of PCPs limited the number of questions we could ask so we could not gather much demographic data on patients, but we found that even busy PCPs could collect useful data within routine consultation in primary care. Other studies on insomnia prevalence were often conducted in the waiting room (e.g., by medical students). Our PCPs included most patients and discussed sleep with them, but we also observed that in more than a third of the cases, the PCP did not know about the sleep complaints of their patient. Our data suggests that a more proactive approach by PCPs to discuss sleep quality is feasible during routine consultations. Along with this, our finding that a PCP's knowledge of prior insomnia symptoms was associated with a higher probability of discussing sleep may reflect bias in one of two directions. 1) It is possible that PCPs missed new insomnia cases because patients never complained about sleep disturbance and were therefore not asked about sleep. Studies have shown that many patients do not address their sleep complaints with their PCP (Ancoli-Israel & Roth, 1999). We do not yet know if screening for insomnia would significantly reduce its burden, but it is possible that early intervention could prevent chronic

insomnia and reduce risk for secondary conditions like depression (Baglioni et al., 2011; Baglioni et al., 2011; Wickwire et al., 2019). 2) We may have overestimated the percentage of patients with insomnia complaints because patients without insomnia symptoms may have been selectively excluded. To determine the extent of this possible bias, we estimated prevalence of chronic insomnia in patients who did not discuss sleep with their PCPs (Supplementary Fig. 3). Taking into account the excluded group, the estimated prevalence was 10.9 %, close to our measured value of 11.1 %. Future studies should also include aspects of sleep onset latency, sleep duration and sleep timing to better characterize insomnia patients; unfortunately, PCP schedules were too busy to allow to include those questions in our study. To learn more about prevalence of all sleep disorders in primary care, future studies could take a broader approach to sleep disorders, not limited to insomnia.

Prevalence of insomnia symptoms in Swiss primary care patients is high and almost none of these patients receives CBT-I, first-line treatment recommended in guidelines. PCPs know little about CBT-I and rarely refer patients for CBT-I treatment, perhaps because they lack professional contacts trained in administering the therapy. To ensure most patients receive optimal care and reduce the burden of chronic insomnia, interventions should be designed to educate PCPs and patients, train more professionals in CBT-I, and connect PCPs to specialists who can provide CBT-I.

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Figure 1: Study flow chart.
Insomnia symptoms = any subjective sleep disturbance. PCPs = primary care physicians, F = female, M = male, pat = patients, y = years.

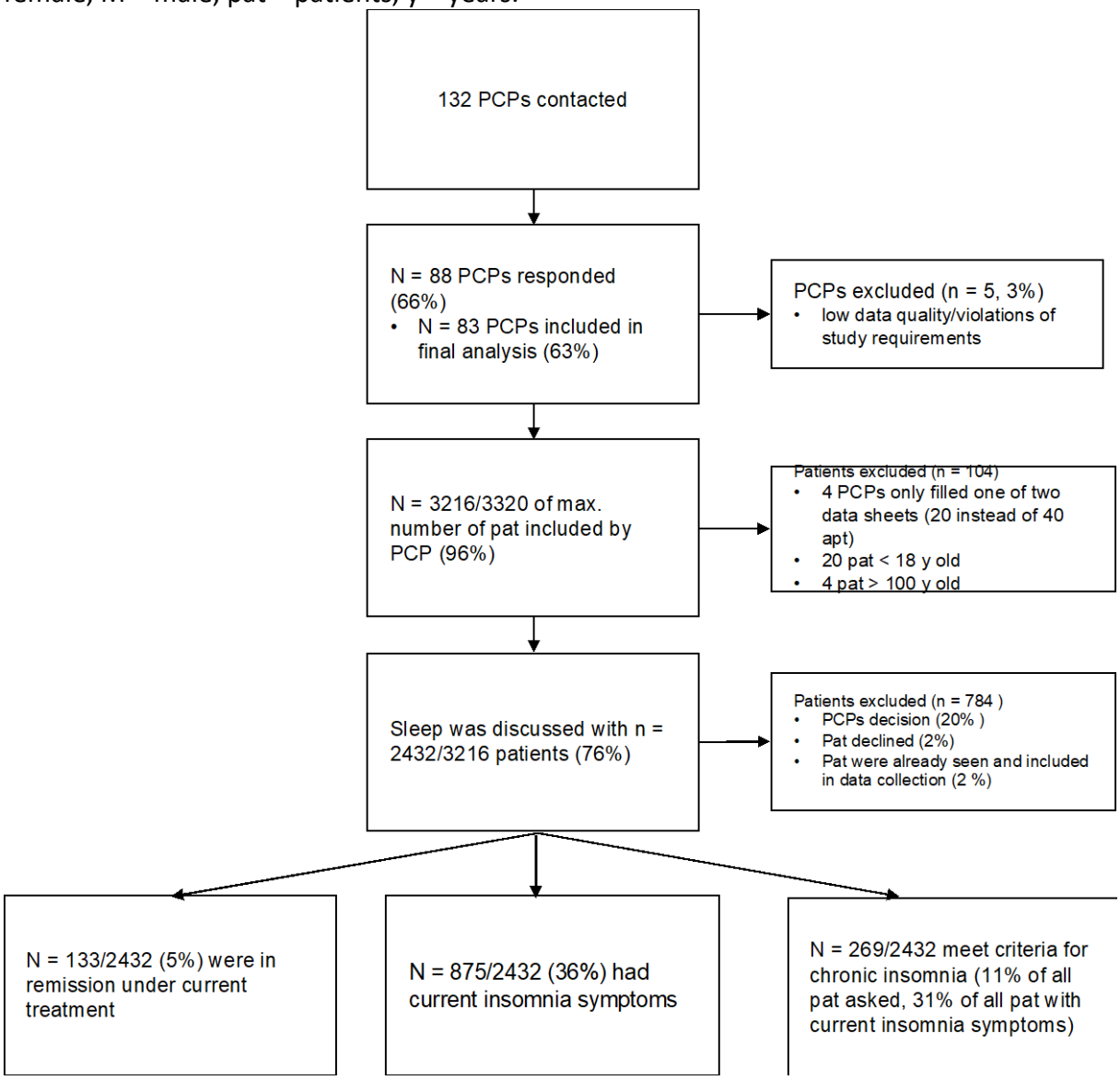


Figure 2. Subjective sleep problems in adult patients in primary care.
Proportion of patients with current subjective sleep problems (insomnia symptoms), patients meeting DSM-5 criteria for chronic insomnia, patients who had sleep problems but have no symptoms under ongoing treatment (in remission under treatment), patients who had sleep complaints in the past but are now without symptoms and under no treatment, and patients without ever sleep complaints.

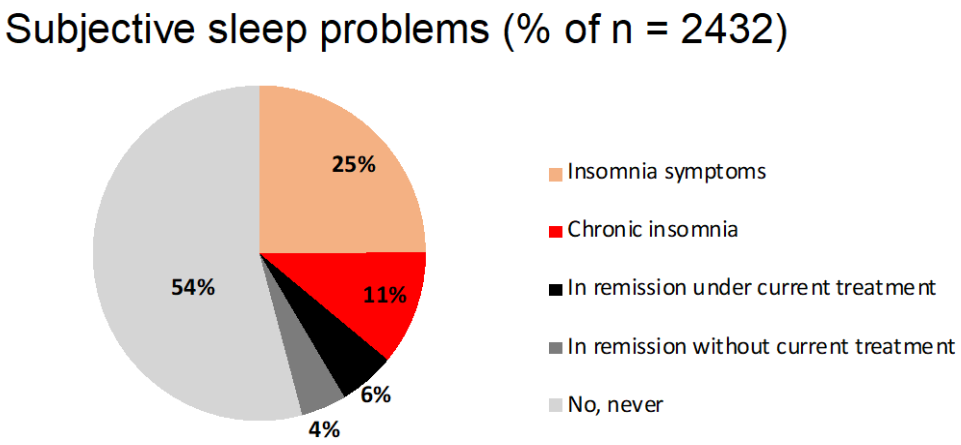


Figure 3. Treatment in patients with chronic insomnia.
Percentage of different treatments in patients with chronic insomnia per medication and different non-pharmacological treatments. Information on treatment type was available for n = 268/269 patients with chronic insomnia. Multiple answers per patients were possible within categories. Grey bar: Proportion of patients with no ongoing treatment. Red bars: Pharmacological treatments. Black bars: Non-pharmacological treatments. BZD: Benzodiazepines, BZRA: Benzodiazepine receptor agonists, Other non-pharm.: Non-pharmacological treatments not further specified. CBT-I: Cognitive behavioral therapy for insomnia.

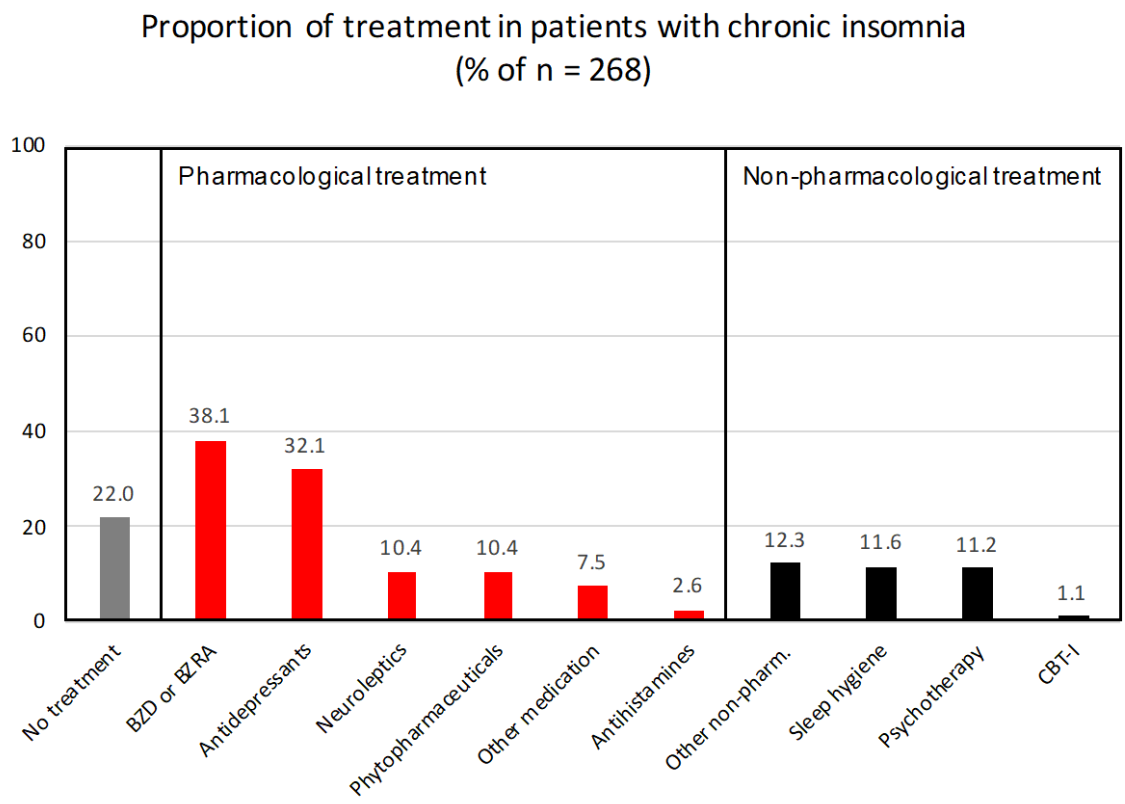
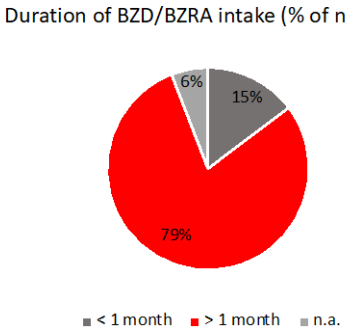
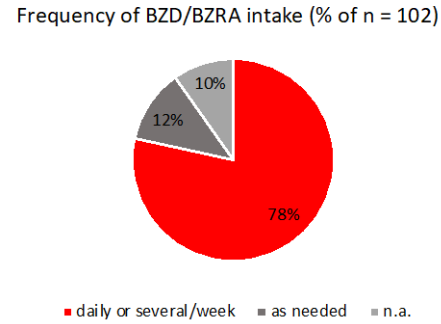


Figure 4. Duration and frequency of hypnotic intake. Duration and frequency of benzodiazepine (BZD) or benzodiazepine receptor agonist (BZRA) intake in patients with chronic insomnia treated accordingly (n = 102). N.a.: data missing. Chronic use is defined as daily to several/week for > 1 month.





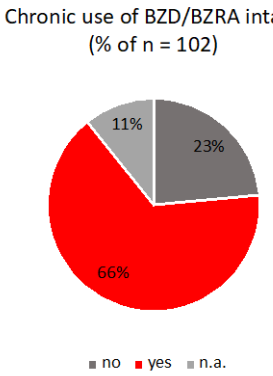


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Table 1
Sociodemographic characteristics and previous insomnia symptoms of patient study population (n = 3216). In patients where sleep was not discussed (last column), sex and age were documented for all patients and previous insomnia symptoms for most (n = 644), but no further information on current sleep problems or treatment was gathered.

	Sleep was discussed (76%, n = 2432/3216)		In remission under current treatment (6%, n=133/2432)		Current insomnia symptoms (36%, n=875/2432)		Meet criteria for chronic insomnia (11%, n=269/2432)		Sleep was not discussed (24%, n = 784/3216)	
Sex	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
female	1235	51	91	68	491	56	163	61	415	53
Age group (years)	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
18-35	379	16	9	7	115	13	27	10	142	18
36-50	463	19	21	16	164	19	56	21	153	20
51-65	647	27	27	30	251	29	86	32	222	28
66-100	942	38	76	57	345	39	100	37	267	34
Mean age	**female**	**male**	**female**	**male**	**female**	**male**	**female**	**male**	**female**	**male**
Years (SD)	58 (18)	58 (20)	67 (18)	63 (16)	59 (18)	59 (18)	61(17)	57 (18)	57 (20)	56 (18)
Previous insomnia symptoms	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
	761	31	119	90	535	61	205	76	131	17

3

4 **Table 3**
5 Comorbidities in chronic insomnia patients (n = 269). Multiple responses per patient were
6 possible.
7

Comorbidity	**N**	**%**
Total	201	75
Depression	99	49
Anxiety	76	38

Chronic pain	70	35
Sleep apnea	31	15
Drug/medication abuse	31	15
Restless legs	25	12

Table 2

Type of sleep complaints in insomnia patients (n = 269). Multiple responses per patient were possible.

Insomnia type	**N**	**%**
Difficulties falling asleep	168	62.45
Fragmented sleep	207	76.95
Early awakening	108	40.15
Non restorative sleep	123	45.72
More than one type	195	72.49
Single type insomnia	74	27.51

Supplementary Tables

Supplementary Table 1

Sociodemographic characteristics of participating Sentinella primary care physicians (n = 83).

Sex	**N**	**%**
female	19	23
Age group (years)	**N**	**%**
30-39	5	6
40-49	16	19
50-59	28	34
>60	34	41
Mean age	**female**	**male**
years (SD)	50 (9)	57 (9)
Region	**N**	**%**
urban	63	76
intermediate	13	16
rural	7	8

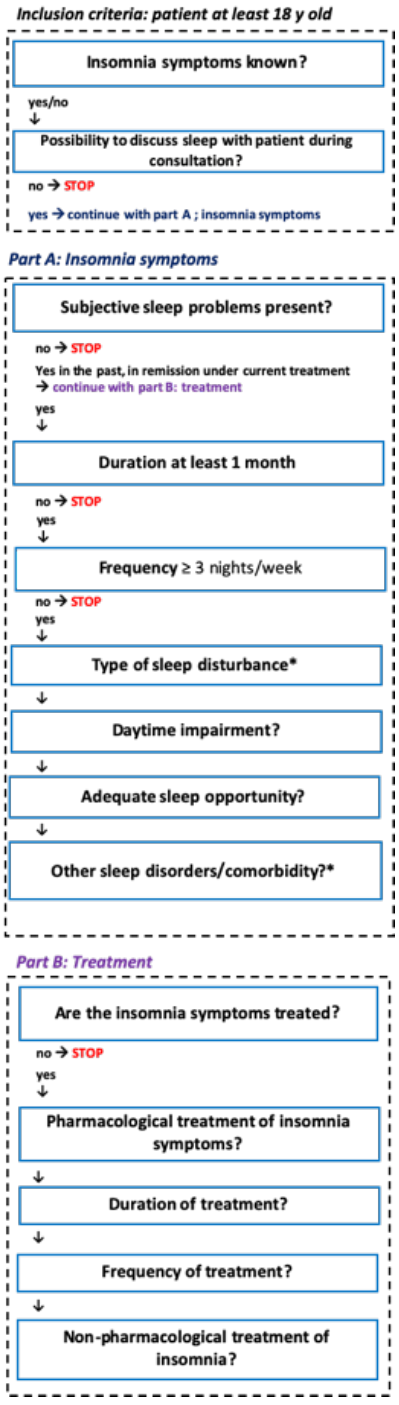
Supplementary Table 2

Type of sleep complaints in insomnia patients (n = 269). Multiple responses per patient were possible.

Insomnia type	**N**	**%**
Difficulties falling asleep	168	62.45
Fragmented sleep	207	76.95
Early awakening	108	40.15
Non restorative sleep	123	45.72
More than one type	195	72.49
Single type insomnia	74	27.51

Supplementary Figures

Supplementary Figure 1.



Supplementary Figure 1. Data collection algorithm.
Flow chart explaining data collection procedure distributed to PCPs. *Multiple answers possible. Duration and frequency of treatment was assessed for benzodiazepines and benzodiazepine receptor agonists only.

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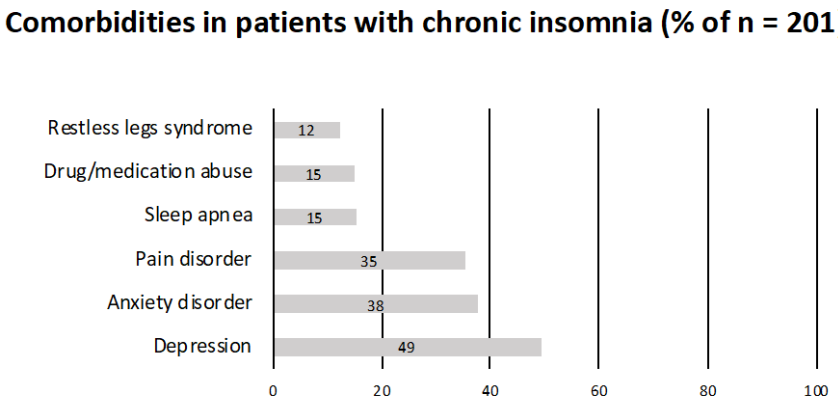
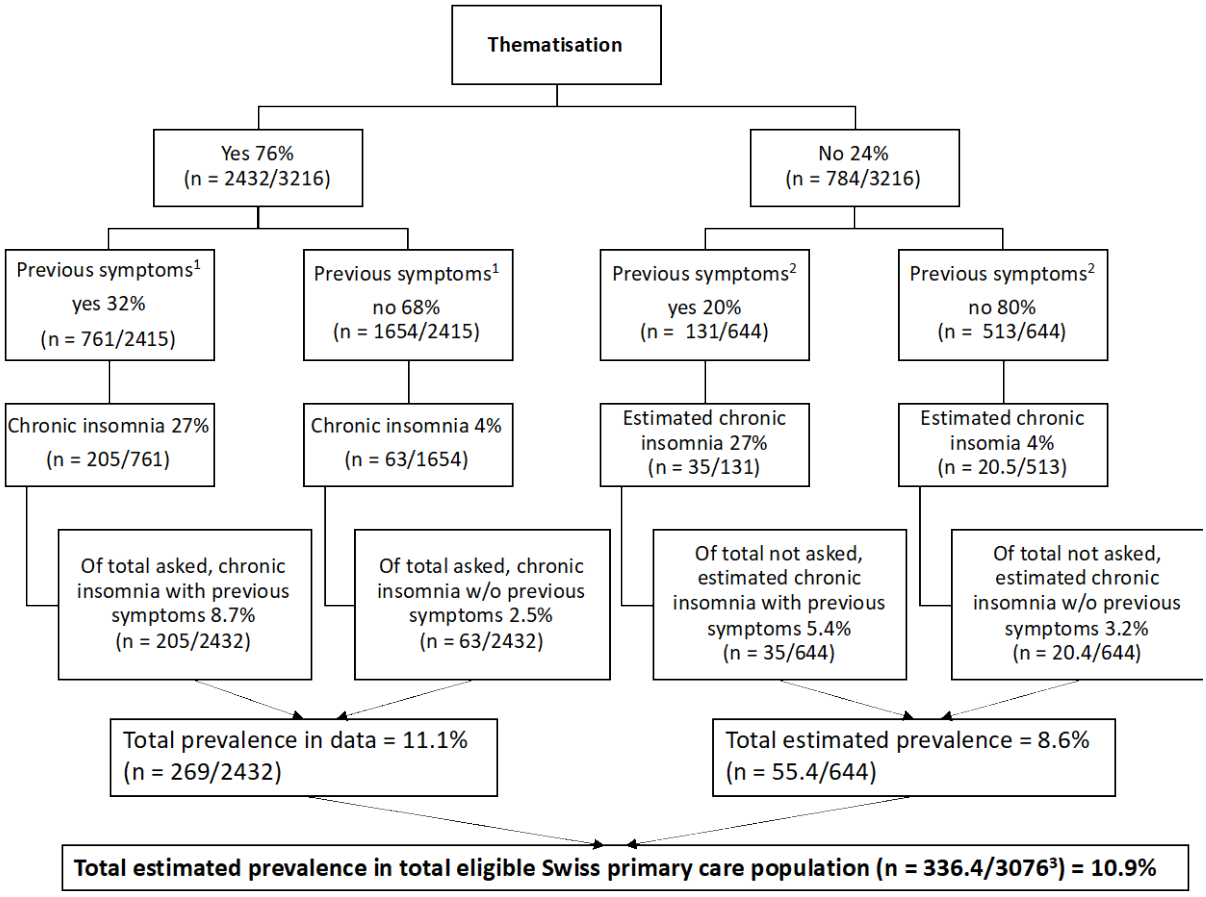
Supplementary Figure 2.



Supplementary Figure 2. Comorbidities in patients with chronic insomnia.
N = 201/269 (75%) patients with chronic insomnia had at least one comorbidity. The figure shows the proportion for prespecified comorbidities as assessed by the PCP in these 201 patients (multiple answers possible per patient).

Supplementary Figure 3.



Supplementary Figure 3. Prevalence estimation for eligible Swiss primary care population. Flow chart shows estimation of prevalence in the general Swiss primary care population. Previous insomnia symptoms (i.e., the primary care physician (PCP) already knew about previous sleep complaints of a patient) were a significant predictor for thematization of sleep problems in an eligible patient. This represents a risk for bias towards an overestimation of the real prevalence. To explore the extent of the bias, we estimated the prevalence of chronic insomnia in patients where sleep was not discussed. We then derived the estimated prevalence of the total study collective (10.9%), deviating less than 1% from our measured data (11.1%). [1]For 17/2432 (0.7%) patients, data on previous insomnia symptoms were missing, one patient of those had chronic insomnia. [2]For 140/784 (18%) patients, data on previous insomnia symptoms were missing. [3]Estimation is based on total number where information on previous symptoms was available.

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