



The International Study on General Practitioners and Early Psychosis (IGPS)

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ABSTRACT

Background: In much of the world, general practitioners (GPs) are the health professionals most frequently initially contacted when a young person is developing psychosis. However little is known about their expertise in assessing psychosis and its risk.

Methods: To assess the diagnostic patterns and treatment practices related to psychosis of GPs working in a range of health care systems, questionnaires were mailed to 12,516 randomly selected GPs in seven countries: Canada, Australia, New Zealand, England, Norway, Austria and the Czech Republic. Sites were defined as gatekeeping or non-gatekeeping, based on the primary care health system in effect at each site. A gatekeeping system (GK) is one which mandates that patients see a GP before in order to be referred to a specialist. By contrast, in a non-gatekeeping (nGK) system, individuals can seek help directly from specialists without authorization by a GP.

Results: Twenty-two percent ($n=2784$) GPs responded to the mailed questionnaire. They reported low prevalence of early psychosis seen in general practice. Using awareness of functional decline as a prognostic sign as a proxy, gatekeeping (GK) GPs were found to be superior in their knowledge of the signs and symptoms of early psychosis than were non-gatekeeping GPs. GP's with less knowledge as to early psychosis were more likely to refer individuals with suspected psychosis to specialists. GP's reported a preference for access to specialized outpatient services as compared with obtaining continuous medical education relevant to early psychosis. The duration of maintenance treatment recommended by GP's was less than that recommended in international guidelines. GP's also underestimated the risk for relapse after a first episode of psychosis.

Conclusions: As GPs were largely unaware of features of early psychosis, such as functional decline, this should be the target of educational programs for GP's. However, the incidence of psychosis is low and GP's express a preference for access to appropriate referral over

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continuing medical education. Therefore, the development of specialized services for the assessment and care of patients who are in the early stages of developing schizophrenia may be warranted.

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1. Introduction

General practitioners (GPs) play a central role in the detection of patients in the early stages of psychosis (Platz et al., 2006). They are frequently consulted by individuals seeking help and commonly refer individuals to mental health services (Skeate et al., 2002; Simon et al., 2007). Their diagnostic acumen could potentially influence the duration of untreated psychosis and possibly the longer term outcomes of patients. However, little is known about their diagnostic skills, which may be relevant for optimizing the early detection and care of subjects at risk of psychosis. This study (*The International GP Study (IGPS) on Early Psychosis*) was initiated to assess the diagnostic knowledge, and treatment practice, attitudes and preferences for support of GPs in countries with different health care systems — including Canada, America, Australia, New Zealand and European countries such as England, Norway, Austria and the Czech Republic. This current study — IGPS — is an extension of a previous survey study of a large sample of GPs, which was restricted to Switzerland (Simon et al., 2005). We were interested to learn if patterns observed in Switzerland among GP's would be generalisable to other health systems worldwide.

2. Materials and methods

2.1. Questionnaire

The IGPS 24-item questionnaire (see Appendix) is a modified (and translated) version of a validated questionnaire used previously in Switzerland (Simon et al., 2005); content and format were agreed upon by all participating investigators at an international consensus meeting in 2003. The IGPS questionnaire consists of two demographic items and 22 questions as to: 1) Numbers of patients seen with either a formal diagnosis of schizophrenia or determined by the GPs to likely be in the early stages of schizophrenia (6 questions); 2) Treatment options (5 questions); 3) Detection and treatment of early psychosis (4 questions); 4) Treatment

and prognosis of schizophrenia (4 questions) and 5) The value of early intervention (3 questions). (Additional site-specific questions chosen by site are not included here in this analysis.) The IGPS questionnaire was translated from German into the most common spoken language at each site; the questionnaire was translated by professionals and then back-translated into German by another professional to ensure that cultural and linguistic idioms did not affect the meaning of each item. The questionnaire was anonymous, and mailed out twice in order to increase the response rate. A coding system (the day and the year of birth of their mother, the day of birth of their father, and gender) was developed to enable matching of GPs who responded to both mailings. This coding system ensured anonymity and was approved by the Eidgenössisches Büro für Datenschutz [Federal Office of Data Protection] for the Swiss questionnaire. The study was approved by the local ethics committee at each site.

2.2. Participating sites

Questionnaires were mailed to 12,516 GPs in 11 sites in seven countries: Canada, Australia, New Zealand, United Kingdom, Norway, Austria and Czech Republic. Three sites were located in Canada (Toronto, Ottawa, Quebec), and two each in Austria (Vienna, Kärnten) and Australia (Melbourne, Sydney) (see Table 1). Sites were distinguished as operating in gatekeeping or non-gatekeeping systems, according to the most common primary care health system at each site. A gatekeeping system is a system that requires that a GP authorize referral to a specialist. In a non-gatekeeping system patients can seek contact specialists directly without consulting a GP. GPs practicing in these systems are referred to as gatekeepers (GK) or non-gatekeepers (nGK), respectively.

2.3. Data management

To identify potential errors in data entry at all sites, 30% of the data were entered twice. Rates of discrepancy between

Table 1
IGPS study sites

Site	GK	nGK	Catchment area	No. of GPs	No. of GPs polled	No. of responses	Response rate (%)
Birmingham	x		England	30,000	3003	718	23.9
Stavanger		x	Rogaland County	275	275	119	43.3
Vienna	x		Vienna/Kärnten	1344/424	1344/424	112/89	11.4
Prague		x	Prague	648	648	129	19.9
Melbourne	x		Melbourne/Sydney ^a	581/558	581/558	205	18.0
Christchurch	x		South Island	900	660	171	25.9
Montreal		x	Quebec	7000	3465	968	27.9
Ottawa		x	Champlain District	581	558	148	26.5
Toronto		x	City of Toronto	4902	1000	142	14.2
Total					12,516	2784	22.2

GK: gatekeeper.

nGK: non-gatekeeper.

^a Sydney: Central Business District and Eastern Suburbs.

Table 2
Characteristics of GPs surveyed

	Total	Gatekeeper	Non- gatekeeper	Significance
<i>GP characteristics</i>				
<i>N (%)</i>	2784	1094 (39.3)	1690 (60.7)	
<i>Gender, n(%)</i>				
Male	1522 (54.7)	607 (55.5)	915 (54.1)	
Female	1262 (45.3)	487 (44.5)	775 (45.9)	
<i>Age</i>				
Mean (\pm SD)	46.4 (9.42)	46.5 (9.39)	46.4 (9.44)	
<i>Years since medical school</i>				
Mean (\pm SD)	20.6 (9.54)	21.9 (8.98)	19.8 (9.79)	
<i>Patient load, mean (\pmSD)</i>				
<i>Suspected early psychosis per year</i>				
None	659 (23.7)	201 (18.4)	458 (27.1)	} <0.001
1–2	1740 (62.5)	769 (70.3)	971 (57.5)	
3–5	273 (9.8)	89 (8.1)	184 (10.9)	
>5	81 (2.9)	21 (1.9)	60 (3.6)	
Established schizophrenia cases in treatment	4.4 (3.28)	5.5 (3.22)	3.7 (3.13)	<0.001
<i>Time spent with patient per consultation, n (%)</i>				
<10 min	139 (4.6)	56 (4.1)	83 (4.9)	} <0.001
10–20	977 (32.1)	527 (39.0)	450 (26.6)	
20–30	1031 (33.9)	342 (25.3)	689 (40.8)	
>30	530 (17.4)	138 (10.2)	392 (23.2)	
No reply	365 (12.0)	289 (21.4)	76 (4.5)	
<i>Current treatment systems and preferences for support</i>				
<i>Treatment system in suspected schizophrenia, n (%)</i>				
Treatment only in GPs practice	51 (1.7)	10 (0.7)	41 (2.4)	} 0.003
Collaboration with specialists	1708 (56.1)	657 (48.6)	1051 (62.2)	
Total referral to specialists	956 (31.4)	402 (36.7)	554 (32.8)	
No reply	327 (10.7)	283 (20.9)	44 (2.6)	
<i>Treatment system in established schizophrenia, n (%)</i>				
Treatment only in GPs practice	154 (5.1)	23 (1.7)	131 (7.8)	} <0.001
Collaboration with specialists	2150 (70.7)	1059 (78.3)	1091 (64.6)	
Total referral to specialists	648 (21.3)	236 (17.5)	412 (24.4)	
No reply	99 (3.0)	34 (2.5)	56 (3.3)	
<i>Needs, n (%)</i>				
CME	1017 (33.4)	289 (21.4)	728 (43.1)	} <0.001
Specialized mobile outreach team	889 (29.2)	433 (32.0)	456 (27.0)	
Specialized outpatient service	2132 (70.1)	839 (62.1)	1293 (76.5)	
No reply	400 (13.1)	308 (22.8)	92 (5.4)	
<i>Diagnostic knowledge</i>				
<i>c-score</i>				
Mean (\pm SD)	6.3 (2.24)	6.5 (2.12)	6.2 (2.31)	<0.0010
<i>t-score</i>				
Mean (\pm SD)	9.3 (2.74)	9.4 (2.68)	9.2 (2.78)	0.02
<i>Treatment recommendations</i>				
<i>Type of treatment, n (%)</i>				
Psychotherapy and family therapy	140 (9.4)	55 (9.2)	85 (9.5)	
Pharmacotherapy	1236 (83.1)	482 (80.7)	754 (84.6)	
Observe and wait	112 (7.5)	60 (10.1)	52 (5.8)	
<i>Duration of maintenance treatment after first psychotic episode, n (%)</i>				
Insufficient duration	1249 (44.9)	445 (40.7)	804 (47.6)	} 0.12
Acceptable duration	1018 (36.6)	330 (30.2)	688 (40.7)	
No reply	517 (18.6)	319 (29.2)	198 (11.7)	
<i>Duration of maintenance treatment in multiple episode patients, n (%)</i>				
Insufficient duration	533 (19.1)	167 (15.3)	366 (21.7)	} 1
Acceptable duration	1654 (59.4)	520 (47.5)	1134 (67.1)	
No reply	597 (21.4)	407 (37.2)	190 (11.2)	

index and control cases were then calculated for each variable. If the error rate for a particular variable exceeded 10%, the site was asked to compare the originally entered data to the written data on the returned questionnaire. In addition, data for all variables were checked for plausibility.

2.4. Analysis

Data were analysed using statistical software SPSS Version 13. A composite score was calculated from the two multi-item questions covering diagnostic knowledge (see Appendix, questions 12 and 13). The items were divided into three different score levels, ranging from 2 (highest score) to 0. AES and DU originally developed this scoring system for the Swiss questionnaire, taking into account the evidence base for early signs of schizophrenia and concurrent realistic expectations for GP's in Switzerland as to detection of such signs (see Simon et al., 2005). Our goal was to capture the knowledge about signs and symptoms of prodromal states that precede overt manifestations of psychosis, as the latter is usually taught in medical school, and the former requires a more specialized knowledge of the trajectory of psychotic illness. Thus, the following items were defined as score-2-items: social withdrawal, functional decline, family history of psychosis, need for obtaining collateral information from significant others and clinical monitoring over several months.

These items represent classic warning signs as well as factors associated with an increased risk of psychosis. Specifically, functional decline and social withdrawal are typical in the early stages of schizophrenia (Hafner et al., 1999), and the need for collateral information arises as patients in the early stages often 'seal over', i.e. deny both social withdrawal and functional decline (Birchwood et al., 1998). 'Observation over several months' was chosen not only because short observation intervals may fail to capture features such as social withdrawal and functional decline, but also because prolonged social and functional decline is a hallmark of the early stages (Hafner et al., 1999). Finally, a family history of psychosis was chosen as it is associated with an increased risk for schizophrenia (Kety, 1987). Hallucinations and delusions, suicidality, depression and anxiety, bizarre behaviour, personal history as well as neuropsychological assessment were rated as score-1-items. All other items were score-0-items.

Two scores were calculated for each GP:

- The sum of all score-2 items constituted the core score (*c*-score) reflecting the level of knowledge about the most important aspects in detecting early stages of schizophrenia;
- The sum of all score-1 and score-2 items constituted the total score (*t*-score).

The composition of the *c*-score allowed the creation of subgroups of knowledge from 0 (no core item identified) to 10 (all 5 core items identified), enabling the investigation of associations of knowledge level with other variables of interest.

Associations between *c*-score levels and caseload, treatment setting and recommended duration of maintenance treatment after a first psychotic episode were analysed using Kruskal–Wallis-tests. Differences between gatekeepers (GKs) and non-gatekeepers (nGKs) were assessed using χ^2 -tests and Mann–Whitney-*U*-tests. We applied a Bonferroni–Holm correction for all tests.

Site-specific analyses were limited to comparisons of core and total scores using ANOVAs and of the score-2-item 'functional decline' using χ^2 -tests, as our analyses found that this item was a proxy measure for overall diagnostic knowledge.

3. Results

3.1. GP characteristics

A total of 2784 (22.2%) GPs responded to the questionnaire. Characteristics of the study sample are summarised in Table 2. GKs and nGKs did not differ in gender, age, and in years since completing medical school. The mean number of patients with established schizophrenia treated by GPs at any one time was 4.4, with more patients being treated by GKs than by nGKs ($\chi^2=233.76$, $df=4$, $p<0.001$). The mean number of patients whom GPs saw and suspected as being in the early stages of schizophrenia was 1.5 per annum, with nGKs more likely to indicate that they saw no such patients ($\chi^2=50.11$, $df=3$, $p<0.001$).

3.2. Current treatment systems and preferences for support

The majority of GPs indicated that they usually treated patients with suspected early schizophrenia (61.3%) in

Table 3

Per site *c*- and *t*-scores and percentage of general practitioners identifying score-2 and score-1 items

	England	Stavanger	Vienna/ Kärnten	Prague	Melbourne/ Sydney	Southern New Zealand	Quebec	Toronto	Ottawa	Total
<i>c</i> -score	6.3	6.1	5.1	5.5	6.8	7.0	6.3	6.7	7.4	6.3
<i>t</i> -score	9.2	8.4	8.4	8.1	9.9	9.7	9.3	9.8	10.4	9.3
Score-2 items										
Functional decline	72.0%	69.6%	52.8%	55.0%	79.6%	83.4%	54.0%	72.7%	83.6%	65.4%
Social withdrawal	82.4%	91.3%	74.6%	58.3%	83.6%	85.2%	79.7%	79.1%	85.2%	80.4%
Information from significant others	85.2%	64.3%	45.1%	67.5%	85.1%	85.8%	74.6%	76.3%	78.9%	76.3%
Prolonged observation	15.1%	14.8%	15.5%	19.2%	17.4%	18.9%	20.2%	29.5%	34.4%	19.1%
Family history	60.4%	64.3%	65.3%	74.2%	76.6%	77.5%	86.7%	78.4%	87.5%	75.1%
Score-1-items										
Hallucinations/delusions	73.2%	63.5%	70.5%	60.0%	61.7%	58.0%	68.4%	69.8%	68.0%	68.1%
Bizarre behaviour	78.8%	47.0%	67.4%	38.3%	60.2%	63.3%	80.9%	73.4%	74.2%	72.7%
Depression/anxiety	40.0%	37.4%	47.7%	71.7%	60.2%	45.0%	37.2%	50.4%	43.0%	43.4%
Suicidality	11.2%	5.2%	10.9%	15.0%	23.9%	13.6%	16.6%	12.9%	12.5%	14.2%
Personal history	73.7%	73.9%	86.5%	74.2%	84.1%	79.3%	80.9%	78.4%	85.9%	79.1%

collaboration with specialists. GPs were more likely to refer patients to specialists rather than provide care in a collaborative manner if they considered the patient's behaviour to be problematic (suspected early schizophrenia: $\chi^2=334.067$, $df=4$, $p<0.001$; established schizophrenia: $\chi^2=479.596$, $df=4$, $p<0.001$). A majority of GPs (70.1%; $n=2132$) preferred easy access to specialized outpatient services, whereas only 33.4% of GPs ($n=1017$) preferred CME (continuous medical education) on early psychosis, and 29.2% ($n=889$) a specialized mobile outreach team.

3.3. Diagnostic knowledge

91.6% ($n=2551$) of the GPs were aware of the existence of early warning signs prior to a first episode of schizophrenia.

Table 3 summarises *c*-scores, *t*-scores and the frequencies of the score-2 items across sites. The sites differed significantly in levels of *c*-score (ANOVA: $F=18.305$, $df=8$, $p<0.001$), *t*-scores (ANOVA: $F=11.717$, $df=8$, $p<0.001$) and the percentage of GPs who identified functional decline as an early warning sign of the early stages of schizophrenia ($\chi^2=147.949$, $df=8$, $p<0.001$). GPs in English speaking countries, i.e. those belonging to the Commonwealth, showed a higher average *c*-score than GPs in non-English speaking, i.e. Continental European countries (6.49, $SD\pm 2.2$ vs. 5.5 $SD\pm 2.3$; $t=8.870$, $df=2694$, $p<0.001$). Overall, about 70% of the GPs identified positive symptoms of psychosis such as hallucinations, delusional ideation or bizarre behaviour.

As one GP strategy may be to refer patients rapidly for further assessment by specialists rather than to observe patients themselves over a prolonged period of time, we assessed whether a low frequency on the 'observation over several months' item was associated with this strategy. The need for clinical monitoring over several months was endorsed by more GP's who did not automatically refer patients, as compared with those who made referrals to specialists (31% vs. 4%). This was the core item endorsed least frequently. This finding suggests that the low frequency with which 'observation over several months' was indicated is not only a function of referral behaviour but may highlight shortcoming of their assessment practice. 'Functional decline' was found to serve as a proxy measure of *c*-score level, with increasing *c*-score predicting better identification of 'functional decline' (*c*-score 2: 0.8% identified vs 7.7% non-identified; *c*-score 4: 6.4% vs 14.1%; *c*-score 6: 19.7% vs 13.2%; *c*-score group 8: 35.3% vs 2.7%).

With regard to GK vs. nGK status, we found that both mean *c*-score and *t*-score were significantly higher in GK than nGK GPs (Mann–Whitney–*U*-Test $Z=-3.67$, $p<0.001$; Mann–Whitney–*U*-Test $Z=-2.32$, $p<0.02$; see Table 2).

3.4. Treatment of first-episode schizophrenia

GPs were provided with a choice of three options as therapy recommendations for a patient with a suspected first episode of schizophrenia: psychotherapy and family therapy, pharmacotherapy, and 'observe and wait'. They were allowed to select more than one option (see Table 2). The question was answered by 2661 GPs (95.6%). 85.4% of GPs recommended pharmacotherapy alone or in possible

combination with other types of therapy. Combined psychotherapy and family therapy was recommended by 42.0% of GPs. Psychotherapy or family therapy alone was selected by only 9.4%. The 283 GPs who did not include pharmacotherapy in their recommendations had significantly poorer diagnostic knowledge: mean *c*-score 6.0 ± 2.41 v. 6.37 ± 2.22 ($t=-2.62$, $df=2637$, $p<0.001$).

3.5. Relapse rate and maintenance treatment

An estimate of 60 to 90% was considered correct for the risk for relapse of psychosis in untreated patients in the year following a first episode of schizophrenia. Of the 1782 GPs (64.0%) who responded, a correct estimate was given by 47.1%. A relapse risk of less than 60% was estimated by 52.9%.

Based on international treatment recommendations (APA, 1997), treatment after a first episode of schizophrenia of fewer than six months was considered insufficient, treatment between six to 12 months as acceptable, and treatment of more than 12 months as correct. 2267 GPs (81.5%) indicated how long they would maintain antipsychotic treatment after a first episode of schizophrenia. 44.9% of these GPs recommended an insufficient duration of treatment, and 36.6% an acceptable or adequate treatment duration according to these international recommendations. GPs who correctly estimated relapse rates after a first episode were more likely to recommend longer "maintenance" treatment in first-episode patients ($\chi^2=15.91$, $df=1$, $p<.001$). Diagnostic knowledge was not associated with recommended treatment length after a first episode.

4. Discussion

This is the largest international survey study of the diagnostic and treatment knowledge, treatment practice and preferences for support of GPs as they relate to early schizophrenia. It included 11 geographical sites and contrasted gatekeeper vs. non-gatekeeper models.

4.1. Limited diagnostic knowledge

Most GPs were aware of the presence of early warning signs in the early stages of schizophrenia. In line with the Swiss (Simon et al., 2005) and a recent French survey (Verdoux et al., 2006), GPs also demonstrated good knowledge of 'positive' symptoms of psychosis. The generally low ranking of depressive symptoms is a relatively encouraging finding, as it suggests that GPs are able to discriminate between psychotic and mood symptoms, which might reduce the risk of over diagnosing schizophrenia in adolescents or young adults with incipient mood disorders.

However, the survey highlighted GPs' limited knowledge as to the importance of 'functional decline' and need for 'observation over several months', consistent with what was found in Switzerland using a similar survey (Simon et al., 2005). However, in contrast to the findings in Switzerland (Simon et al., 2005), the recognition of the importance of 'functional decline' in this study was an indicator of better overall diagnostic knowledge.

4.2. Treatment strategies

Diagnostic knowledge, however, was unrelated to accuracy of estimates of typical relapse rates or suggested optimal duration of treatment after a first episode of psychosis. GPs underestimated this relapse risk and did not endorse the treatment duration recommended in international guidelines (APA, 1997). This suggests that these two key educational messages need further reinforcement in primary care, particularly since GPs in most health systems are responsible for continuing care and family support, and are key sources of information about long term medication.

4.3. Influence of health systems

Although all participating sites were in economically developed countries, they represented a range of different health care systems. Although diagnostic knowledge was low across the entire sample, gatekeeping GPs had more diagnostic knowledge and identified more score-2 items than non-gatekeeping GPs. These gate-keeping GPs were more likely to refer patients to specialists and to clearly favour specialized, low-threshold outpatient services over continuing medical education (CME). Also, GPs in Commonwealth countries had more diagnostic knowledge than those in Continental Europe. This may reflect differences in teaching models between some of the countries participating in the study. Central and Eastern European schools still employ traditional teaching methods, while newer educational models such as problem based learning are more common in Anglo-American medical schools (Grielen et al., 2000; Wood, 2003). The results may also reflect differences in the integration of psychiatry into GP postgraduate training, with less integration in Central and Eastern Europe. For example, GPs in the Czech Republic are only allowed to prescribe a limited number of psychotropic medications, and are not encouraged by psychiatrists to provide care for people with mental health problems. In contrast, in study sites with a long tradition of partnership between GPs and psychiatrists working in first episode psychosis (such as Melbourne or Toronto), GPs had better diagnostic knowledge scores (see Table 3). These conclusions, however, are speculative and require further research.

4.4. Limitations

This study has a number of limitations. The response rate was low at 22.2%, although comparable to that seen in other studies (Simon et al., 2005; Verdoux et al., 2006). Those who responded may have had a particular interest in mental health, and this raises concerns about a potential differential level of knowledge in non responders. The questionnaire responses assess stated rather than actual behaviour, and should therefore be considered a 'proxy' measure of intended behaviour (Penn and Corrigan, 2002). Mailed questionnaires are also prone to social desirability bias (Fowler, 2002). Participating sites were all in economically developed countries and results may, therefore, not be generalisable to countries in the developing world, especially given differences between the Czech Republic and other countries. In a few sites, both gatekeeping and non-

gatekeeping models exist. Our strategy to assign a categorization to a site based on the most prominent health system therefore included a small number of inappropriately assigned GK and nGK GPs. Explorative qualitative work in each site might have helped us to interpret the meaning of the results in greater depth, but study funding precluded such a 'mixed methods' approach.

4.5. Implications of the study

This study has a number of important implications for GP education across health systems in developed countries:

- GPs showed deficits in identifying some of the insidious features of early psychosis, such as functional decline, while showing more appropriate knowledge of 'positive' symptoms such as hallucinations or delusional ideation.
- As the incidence of impending psychosis is relatively low and people often present with insidious features, CME by itself may not be sufficient to increase detection rates and potentially reduce the duration of untreated psychosis, especially as GPs do not express a preference for this learning strategy. Indeed, a large-scale international systematic review of 36 studies found that CME alone is insufficient to improve GPs' management of mental health problems (Gilbody et al., 2003).
- Educational messages therefore need to be clear and simple: if unexpected functional decline is observed, a patient should be referred for further assessment to a psychiatrist who specializes in first episode psychosis. If the primary aim of early intervention is to detect patients as early as possible in their illness, GPs' awareness of the disorder's earliest features – functional decline and social withdrawal – should be a focus of educational initiatives.
- As the majority of GPs, regardless of the health care system they worked in, expressed the need for specialized, low-threshold outpatient services for further assessment and treatment of at-risk patients, as compared with CME, this may be a more effective strategy – the implementation of specialized services – than further education of GPs.

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Contributors

Drs Simon and Umbricht were the principle investigators of the study, had a principle role in study design, creation of the database, supervision of all sites, data analysis and drafting of the article. All other authors were local principle investigators and substantially contributed to interpretation of data and reversing it critically for important intellectual content, and gave final approval for the version to be published.

Conflict of interest

None.

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Appendix

IGPS questionnaire

1. Do you think that a beginning schizophrenia is preceded by early warning signs?

- Yes No

2. How many patients with an established diagnosis of schizophrenia do you psychiatrically treat in your practice annually?

- None 1–2 3–5 6–9 ≥ 10

3. How many patients in whom you suspect a beginning schizophrenia do you see in your practice annually?

- None 1–2 3–5 ≥ 5

4. How much time do you generally invest for a consultation of a patient with (suspected beginning) schizophrenia?

- < 10 min 10–20 min 20–30 min > 30 min

5. In order to estimate how many patients with a suspected beginning schizophrenia are seen in a general practice, we should like you to indicate the overall number of patients you treat annually.

- Patients

6. What are the annual proportions of age groups you treat in your practice?

- < 18 y _____ % 18–35 y _____ % 36–65 y _____ % > 65y _____ %

7. Are patients with suspected beginning psychosis treated by you alone or in collaboration with other specialists or institutions (only one answer allowed)

- Treatment exclusively in my practice
 Occasional/regular consultation with a specialist to reassess/advise; referral to a specialist for initial diagnosis and to establish the medication regimen, continuation of treatment in my practice
 Complete handover to a specialist/psychiatric outpatient department for treatment

8. Are patients with established schizophrenia treated by you alone or in collaboration with other specialists or institutions (only one answer allowed)

- Treatment exclusively in my practice
 Occasional/regular consultation with a specialist to reassess/advise; referral to a specialist for initial diagnosis and to establish the medication regimen, continuation of treatment in my practice
 Complete handover to a specialist/psychiatric outpatient department for treatment

9. Are you satisfied with the collaboration with specialists?

- Not at all 1 – 2 – 3 – 4 – 5 Very much

10. We are interested to know whether you encounter difficulties in the psychiatric treatment of schizophrenic patients. (only one answer allowed)

- No difficulties
 Despite problematic behavior (e.g. aggression, illicit drug abuse) of the schizophrenic patients, I am able and wish to continue their psychiatric treatment in my practice
 Because of problematic behavior (e.g. aggression, illicit drug abuse) of the schizophrenic patients, I prefer not to carry out their psychiatric treatment in my practice

11. With regard to treatment of early schizophrenic psychosis, which are the psychiatric services that you wish/need in your region? (more than one answer allowed)

- More continuous education
 Specialized mobile team for assessment in your practice
 Specialized, low-threshold referral and consulting service (outpatient department/ consultation in clinic)

12. Which are the symptoms that you encounter most frequently when you assess for a suspected beginning schizophrenia? (more than one answer allowed)

- Hallucinations/delusions
 Social withdrawal
 Psychosomatic complaints
 Suicidality
 Depression/anxiety
 Bizarre behaviour
 Drug abuse
 Conflicts with parents/teachers/employers
 Decline in social functioning (school/work)
 Sleeping difficulties
 Light-headedness / dizziness

13. What do you generally do to corroborate the diagnosis? (more than one answer allowed)

- Personal history
- Family history
- Information from significant others (family/employer/school)
- Observation over several days and weeks
- Observation over several months
- Neurological assessment
- Neuropsychological assessment
- Other examinations (Rx, electrophysiological)
- Laboratory tests
- Urine toxicology
- Consultation with/referral to a specialist
- Direct questioning of patient about relevant symptoms

14. What therapy would you recommend for a patient with a suspected first schizophrenic episode (independent of whether you treat these patients yourself)? (more than one answer allowed)

- Psychotherapy and family therapy
- Pharmacotherapy
- Observe and wait only (monitoring)

15. If you medicate, what medication do you most commonly use in patients with a first schizophrenic episode that you treat in your practice, and what are the doses you use?

_____ (name) _____ mg/d _____ (name) _____ mg/d
 _____ (name) _____ mg/d _____ (name) _____ mg/d

16. How long would you maintain antipsychotic medication after a first schizophrenic episode in your patients?

- Few days
- 3–4 weeks
- 1–6 months
- 6–12 months
- 12–24 months
- 3–5 years

17. How long would you maintain antipsychotic medication in multiple episode patients after the remission of an episode?

- Few days
- 3–4 weeks
- 1–6 months
- 6–12 months
- 12–24 months
- At least 3–5 years

18. How high do you estimate the relapse risk of untreated patients during the first year after a first schizophrenic episode? _____%**19. Which are the two clinically most relevant side effects of long-term antipsychotic treatment that you encounter?**

- Extrapyramidal symptoms
- Tardive dyskinesia
- Sedation
- Dizziness
- Weight gain
- Blurry vision
- Dry mouth
- Sexual dysfunction
- Galactorrhea
- Haematological side effects
- Effects on liver enzymes
- Seizures
- Metabolic side effects (diabetes, elevation of serum lipids)

20. Based on your experience, how do you judge the prognosis of a treated patient after a first schizophrenic episode? (only one answer allowed)

- The prognosis may be favourable; one single episode with maintenance of performance level is possible
- Mostly several episodes with possible maintenance of performance level
- Mostly several episodes with progressive decline of performance level and severe course of illness

21. Do you think targeted early detection of schizophrenia prior to a first psychotic episode is possible?

- Not possible
- Occasionally possible
- In most cases possible

22. How would you estimate the impact of early intervention (prior to a first psychotic episode) on the course of schizophrenia?

- No impact
- Modest impact
- Big impact

23. How many years ago did you finish medical school?

- Years

24. Please indicate your age.

- Years

Examples of additional site-specific items

25. Did you participate in a continuous education on schizophrenia or early schizophrenic psychosis in the last few months?

No Yes; please indicate name, place and date of education

26. Please indicate your degree of specialty.

General medicine Internal medicine Other

27. Was psychiatry part of your specialty formation?

Yes No

28. Do you practice in an urban or in a rural region?

City without university City with university Rural region

Coding system for the anonymisation of your answers

Day of birth of your mother

(e.g. 28.06.1930)

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2	8
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Year of birth of your mother

(e.g. 28.06.1930)

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3	0
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Day of birth of your father

(e.g. 04.12.1925)

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0	4
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Your gender (m or f)

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We should like to thank you for your time and your very important collaboration in helping to improve intervention of schizophrenic psychoses to which you have contributed with your information.

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