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*Article*

# Information management and reading habits of German diabetologists: a questionnaire survey

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## Abstract

*Aims/hypothesis.* Journals play an important part in continuing medical education and in influencing the prescription of drugs. Because little is known about reading habits and information management of specialists a questionnaire survey among German diabetologists was conducted.
*Subjects and methods.* A non-randomised sample of 461 German diabetologists was selected from a database of German diabetologists ($n$=1585). A questionnaire was developed (92 items) which consisted of eight sections: continuing education in general, decision making and problem solving, use of databases, reading habits, knowledge of technical terms and critical appraisal skills, personal data.
*Results.* The adjusted response rate was 57% (crude 52%). Most influential factors for therapeutic decision making were due to own experience, continuing education events, published material, and colleagues. The influence of industry related factors was perceived low. A relatively high rate of respondents (39%) perceived the influence by patients as rather low. Overall 90% had convenient access to the internet, MedLine or EMBASE but only 45% searched databases regularly (three searches per month). Median time for reading journals was 3 h a week. Five journals were read regularly, 25% of which were diabetological journals and 47% of the respondents did not read English written journals regularly. The methods section of an article was seldom read whereas the abstract and the discussion were almost always read. Most respondents had some understanding of technical terms but reported practices of appraising articles were inadequate.
*Conclusion/interpretation.* It could be shown that reading expenditures and critical appraisal skills of diabetologists are slightly higher compared with non-specialists. But the concept of evidence-based medicine still does not seem to be incorporated in clinical practice. [Diabetologia (2002) 45:764–774]

**Keywords** Clinical medicine, continuing medical education, decision making, diabetologists, evidence-based medicine, information management, periodicals, physicians, questionnaires, reading habits.

Journals play a major part in continuing medical education (CME) of physicians [1, 2, 3]. They are relatively inexpensive, convenient to handle, and they are viewed as one of the best information sources for identifying innovative technologies [4]. But the influence of reading journal articles on clinical decision making is not clear [5, 6, 7, 8, 9, 10]. This could be due to the perception that clinical research is not appropriate enough [11], critical appraisal skills are not sufficient, or there could be other problems with interpreting medical articles [12, 13, 14, 15, 16]. Moreover, opinion leaders suspect that physicians obtain information about drug therapy mainly from the pharmaceutical industry and not from peer-reviewed jour-

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*Abbreviations:* CME, Continuing medical education; IQR, interquartile range

nals. They assume that physicians often base their therapeutic decisions on promotional material and on the opinion of colleagues and that this problem is particularly predominant in Germany compared to the United Kingdom or the United States [17, 18]. This debate was stimulated by the evidence-based medicine movement and is reflected in the ongoing discussion about quality assurance, mandatory continuing medical education and by the efforts made to promote evidence-based medicine [19, 20].

Some studies evaluated the habits of continuing medical education, information management, reading, and attitudes towards evidence-based medicine [2, 3, 21, 22, 23, 24, 25, 26, 27, 28]. Most of these studies are based on general practitioners or general internists. Therefore little is known about specialists. As this holds true for diabetologists an explorative survey was conducted among German diabetologists. Furthermore this survey was intended to provide the more anecdotal assumptions and the on-going discussions with some facts.

## Subjects and methods

*Questionnaire.* A questionnaire was developed considering three already published surveys [23, 27, 29]. It consisted of eight sections and comprised 92 items of which three were asked openly. The questions relevant for this article covered the following fields (Appendix): therapeutic decision making, information about innovative drugs, database handling, reading habits, importance of journals in connection with innovative drugs, methods of evaluating journal articles (applying a question published previously [23]), knowledge of technical terms (applying a question published previously [27]), personal data, and comprehensibility of the questionnaire.

Regarding the question about the knowledge of technical terms the previously published question was modified according to the terms and the response-categories [27]. In addition, the knowledge of a fictitious term (McNemar Quality Scale) was tested to evaluate socially desired responses. From the responses to the remaining 12 terms a knowledge score was calculated: every affirmative answer to the category "I understand this term and could explain it to others" was valued with one point, to the category "I have some understanding" was valued with a half point. The sum total was rounded and the maximum score was 12 points. Readiness to learn was also calculated: the number of affirmative answers to the category "do not know this term but would like to understand" was divided by the sum of this category and of the category "do not know". Eventually there was a question on the importance of these terms in daily clinical work.

*Sample.* The sample comprised 461 diabetologists in the northern part of Germany and was selected from a database of German diabetologists (Diabetologen, DDG; http://www.diabetesweb.de) because the German Diabetes Association (DDG) could not provide data directly. It represented 29% of all 1585 diabetologists in the database. For technical reasons it was not possible to draw a random sample; therefore, the sample was selected by the first figure of the zip code (codes 1–3; this area covers 10 different states and includes the biggest cities as well as rural parts of Germany). Sample size was calculated with regard to confidence intervals for frequencies: a 95% CI of 10%–15% for questions answerable dichotomously was considered narrow enough. This required a sample size of about 200 persons. Response rates of prior surveys ranged from 50% to 70%.

In October 2000 the questionnaire was distributed for the first time. One week later a reminder was sent to all participants and after 3 weeks another questionnaire was sent to all non-respondents. A cover letter was enclosed with a stamped self-addressed envelope. Coding by numbers for response control was explicitly mentioned but the analysis was fully anonymous.

*Statistical analyses.* Descriptive statistics were mainly used. The chi-square test was used for comparisons of categorical data (Yates continuity corrected for comparisons with one degree of freedom). Two-sided $p$ values of less than 0.05 were considered significant. Analyses were done with EpiInfo 2000, version 1.0.4 and KyPlot, version 2.0.

## Results

Of the 461 questionnaires distributed, 45 (10%) were returned because they were undeliverable. In this group the proportion of hospital-based physicians was higher (33/45: 73% vs 199/416: 48%; $\chi^2$=9.564; $p$=0.002) and the proportion of practising physicians was lower (9/45: 20% vs 187/416: 45%; $\chi^2$=9.349; $p$=0.002) than in the remaining sample. Other differences have not been found.

There were 239 questionnaires eligible for analysis, resulting in a crude response rate of 52% and an adjusted response rate of 57%. The characteristics of the respondents, all German diabetologists (Diabetologen DDG), and the whole sample were compared (Table 1) as well as all the respondents and non-respondents (Table 2).

Of the respondents 24% (56/235) stated that the questions were easy to understand, 68% (160/239) found them rather easy to understand, and 8% (19/235) found them rather difficult. Nobody found the questions difficult to understand. Comments on the survey were very different and ranged from "such questionnaires are impertinent" to "very good survey on an important issue, and possibly I will reconsider my continuing medical education habits" (positive and negative comments were roughly balanced).

*Therapeutic decision making.* Own experience, published material, as well as recommendations from colleagues were most important for the therapeutic decision making of the respondents (Fig. 1). A remarkable 39% (92/238) of the respondents reported that patients had a rather small to no influence on therapeutic decisions. By a wide margin the most important sources to hear about innovations were CME events (146/236: 62%), published clinical trials (145/236: 61%), and pharmaceutical representatives (136/236: 58%). Other

**Table 1.** Characteristics of respondents, sample, and all German diabetologists

| | Respondents (%; 95% CI) | Sample | Diabetologists[a] |
|---|---|---|---|
| Sex | | | |
| Female | 65/239 (27%; 22%–33%) | 149/461 (32%) | not available |
| Male | 174/239 (73%; 67%–78%) | 312/461 (68%) | not available |
| Work place | | | |
| Practice | 102/239 (43%; 36%–49%) | 196/461 (43%) | 666/1885 (40%) |
| Hospital | 109/239 (47%; 39%–52%) | 232/461 (50%) | 1009/1885 (60%)[b] |
| University hospital | 23/239 (10%; 6%–14%) | 33/461 (7%) | |
| Other | 5/239 (2%; 1%–5%) | 0/461 (0%) | 0/1885 (0%) |
| Size of the city (work place) | | | |
| <20,000 | 49/239 (21%; 16%–26%) | 115/461 (25%) | not available |
| 20,000–100,000 | 92/239 (38%; 32%–45%) | 135/461 (29%) | not available |
| 100,000–250,000 | 39/239 (16%; 12%–22%) | 80/461 (17%) | not available |
| >250,000 | 59/239 (25%; 19%–31%) | 131/461 (28%) | not available |
| Zip code[c] | | | |
| 1 | 72/237 (30%; 25%–37%) | 139/461 (30%) | not available |
| 2 | 68/237 (29%; 23%–35%) | 137/461 (30%) | not available |
| 3 | 97/237 (41%; 35%–48%) | 185/461 (40%) | not available |
| Speciality | | | |
| Internal medicine | 193/239 (81%; 75%–85%) | not available | 1293/1885 (77%) |
| Family medicine | 20/239 (8%; 5%–13%) | not available | 250/1885 (15%) |
| Paediatrics | 25/239 (10%; 7%–15%) | not available | 112/1885 (7%) |
| Other | 1/239 (0%; 0%–2%) | not available | 20/1885 (1%) |
| Rate of diabetic patients | | | |
| <10% | 13/237 (6%; 3%–9%) | not available | not available |
| 10%–50% | 126/237 (53%; 47%–60%) | not available | not available |
| 50%–90% | 63/237 (27%; 21%–33%) | not available | not available |
| >90% | 35/237 (15%; 11%–20%) | not available | not available |
| Year of graduation | | | |
| Median | 1979 | not available | not available |
| IQR[d] | 1971–1984 | not available | not available |
| Range | 1957–1995 | not available | not available |
| Mode | 1970 and 1980 | not available | not available |
| Weekly hours of work | | | |
| Median | 55 h | not available | not available |
| IQR[d] | 50h-60 h | not available | not available |
| Range | 8h-100 h | not available | not available |
| Mode | 60 h | not available | not available |

[a] Data from Willms (2000): Ausschuß Diabetologe DDG: Jahresbericht 1999. URL: http://www.deutsche-diabetes-gesellschaft.de/frames/frame2.htm (Accessed 10/9/2000)

[b] Hospital and university hospital combined

[c] Two questionnaires returned without code number

[d] IQR, interquartile range

sources were narrative reviews (65/236: 28%), literature from the industry (55/236: 23%), and advertisements (54/236: 23%). All remaining sources were only of minor importance (colleagues 25/236: 11%; quality circles: 24/236: 10%; systematic reviews: 21/239: 9%; books and published guidelines: 5/236: 2%; patients: 3/236: 1%).

*Use of databases.* Of the respondents 45% (107/238) reported that they used databases regularly. The median number of database searches a month was three [interquartile range (IQR): 2–5; range: 1–55; mode: 1]. Of the respondents 88% (88/107) did searches until they had satisfying results, 9% (10/107) spent more than 45 min, 7% (8/107) between 15 and 45 min and one respondent spent under 15 min per search. The most important reason not to conduct database searches was the effort involved (97/120: 81%). This was followed by a limited knowledge of how to handle a database (72/120: 60%). Only a minority thought that the results of such searches were dissatisfying (28/120: 23%). All reasons reported in

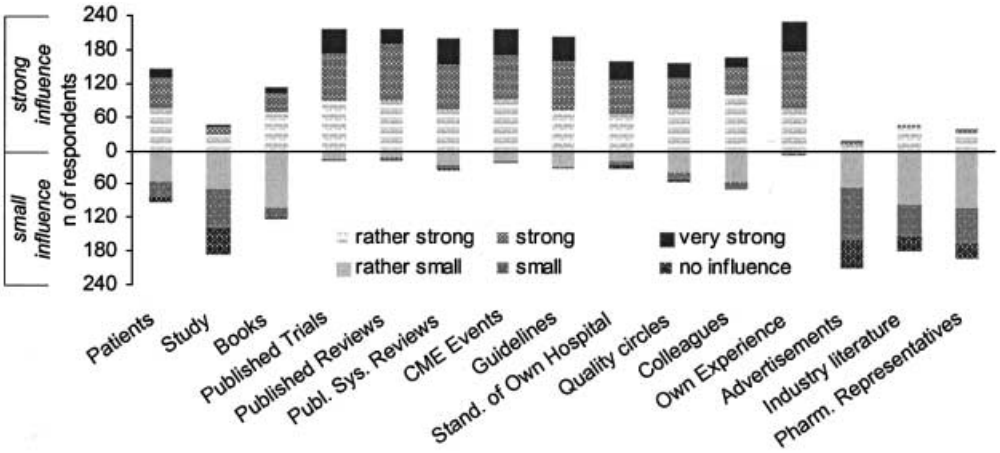


**Fig. 1.** Self perceived influence of various factors on therapeutic decision making. Crosses at category 'Do not use' were disregarded

**Table 2.** Characteristics of respondents and non-respondents

| | Respondents | Non-respondents | $\chi^2$ | *p* value |
|---|---|---|---|---|
| Sex | | | | |
| Women | 65/239 (27%) | 84/222 (38%) | | |
| Men | 174/239 (73%) | 138/222 (62%) | 5.481 | 0.019 |
| Work place | | | | |
| Practice | 102/239 (43%) | 94/222 (42%) | | |
| Hospital | 109/239 (47%) | 123/222 (55%) | | |
| University hospital | 23/239 (10%) | 10/222 (5%) | | |
| Other | 5/239 (2%) | 0/222 (0%) | 6.188 | 0.045 |
| Size of the city (work place) | | | | |
| <20,000 | 49/239 (21%) | 66/222 (30%) | | |
| 20,000–100,000 | 92/239 (38%) | 43/222 (19%) | | |
| 100,000–250,000 | 39/239 (16%) | 41/222 (18%) | | |
| >250,000 | 59/239 (25%) | 72/222 (32%) | 21.04 | <0.001 |
| Zip code[a] | | | | |
| 1 | 72/237 (30%) | 67/222 (30%) | | |
| 2 | 68/237 (29%) | 69/222 (31%) | | |
| 3 | 97/237 (41%) | 88/222 (40%) | 0.259 | 0.88 |

[a] Two questionnaires returned without code number

the answers to the open question fell into these categories as well. Overall 44% (98/225) of respondents had access to the world wide web, MedLine or EMBASE on their ward or surgery, 16% (35/225) had it in their hospital, and 31% (70/225) at home. Only 10% (22/225) had to go to a medical library (e.g. at a university hospital) for such an access. The relation between access and conduct of database searches was not conclusive.

*Reading habits.* The median time for reading was 3 h a week for journals (IQR: 2–5; range: 0–16; mode: 2) and 1 h (IQR: 1–1; range: 0–7; mode: 1) for books. The median number of journals that were read regularly was five (IQR: 4–7; range: 0–15; mode: 4) 25% of which were diabetological journals (IQR: 20%–40%; range: 0%–100%; mode: 25%), and 13% were journals written in English (IQR: 0%–33%; range: 0%–83%; mode 0%). On average respondents read one diabetological journal [most important "Diabetes und Stoffwechsel" – the official journal of the German Diabetes Association (232/239: 97%) and "Experimental and Clinical Endocrinology and Diabetes" (68/239: 29%)] and 47% (111/238) of respondents did not read English written journals regularly. A majority of respondents who read journals in English read one to two of these [most important "The New England Journal of Medicine" (80/239: 34%) and "Experimental and Clinical Endocrinology and Diabetes" (68/239: 29%)].

**Table 3.** How diabetologists appraise the scientific validity of a research article

| | Always | Often | Seldom | Never |
|---|---|---|---|---|
| Compare with own experience (*n*=230) | 82 (36%) | 119 (52%) | 27 (12%) | 2 (1%) |
| Rely on editors/peer review process (*n*=225) | 4 (2%) | 104 (46%) | 99 (44%) | 18 (8%) |
| Depends on authors reputation (*n*=225) | 10 (4%) | 83 (37%) | 96 (43%) | 36 (16%) |
| Contact authors' (*n*=223) | 0 (0%) | 3 (1%) | 82 (37%) | 138 (62%) |
| Examine methods section (*n*=226) | 15 (7%) | 70 (31%) | 89 (39%) | 52 (23%) |
| Discuss with colleagues (*n*=227) | 15 (7%) | 150 (66%) | 59 (26%) | 3 (1%) |
| Discuss with clinical experts (*n*=225) | 8 (4%) | 77 (34%) | 113 (50%) | 27 (12%) |
| Discuss with expert in research methods (*n*=226) | 2 (1%) | 17 (8%) | 108 (48%) | 99 (44%) |

**Table 4.** Knowledge of technical terms

| | Understand and could explain to others | Some understanding | Knowledge but no understanding | Do not know but would like to | Do not know |
|---|---|---|---|---|---|
| Systematic Review (*n*=233) | 113 (49%) | 94 (40%) | 9 (4%) | 9 (4%) | 8 (3%) |
| Meta-Analysis (*n*=235) | 158 (67%) | 61 (26%) | 6 (3%) | 7 (3%) | 3 (1%) |
| Publication bias (*n*=235) | 46 (20%) | 51 (22%) | 34 (15%) | 43 (18%) | 61 (26%) |
| Relative risk reduction (*n*=233) | 104 (45%) | 77 (33%) | 12 (5%) | 25 (11%) | 15 (6%) |
| Absolute risk reduction (*n*=234) | 104 (44%) | 81 (35%) | 13 (6%) | 21 (9%) | 15 (6%) |
| Number needed to treat (*n*=235) | 128 (55%) | 55 (23%) | 7 (3%) | 15 (6%) | 30 (13%) |
| Intention-to-treat analysis (*n*=234) | 101 (43%) | 62 (27%) | 18 (8%) | 22 (9%) | 31 (13%) |
| Confidence interval (*n*=231) | 61 (26%) | 63 (27%) | 36 (16%) | 25 (11%) | 46 (20%) |
| Alpha error (Type-I-Error) (*n*=233) | 33 (14%) | 49 (21%) | 34 (15%) | 44 (19%) | 73 (31%) |
| Beta error (Type-II-Error) (*n*=233) | 34 (15%) | 47 (20%) | 34 (15%) | 45 (19%) | 73 (31%) |
| Positive predictive value (*n*=233) | 69 (30%) | 91 (39%) | 27 (12%) | 26 (11%) | 20 (9%) |
| Odds ratio (*n*=234) | 67 (29%) | 79 (34%) | 24 (10%) | 19 (8%) | 45 (19%) |
| McNemar-Quality-Scale (*n*=234) | 1 (0%) | 16 (7%) | 24 (10%) | 76 (33%) | 117 (50%) |

When respondents read a scientific article only 2% (4/176) always read its methods section, 34% (60/176) read it often, 57% (100/176) seldom, and 7% (12/176) never. In contrast the abstract was read almost always (140/182: 77% always; 42/182: 23% often) as well as the discussion (72/179: 40% always; 92/179: 51% often; 15/179: 8% seldom).

*Critical appraisal and knowledge of technical terms.* How the respondents evaluated the scientific validity of a research article related to a clinical problem was recorded (Table 3). Only a minority evaluated it by examining methods. An overwhelming majority compared the results with their own experience to appraise its scientific validity.

Median knowledge-score of technical terms was six (IQR: 4–8; range: 0–12; mode: 6). Most problematic terms were the two errors related to hypothesis testing (Table 4). On average about one third of the respondents stated that they could explain the meaning of respective terms to others. Remarkably, the term 'Meta-Analysis' was allegedly understood much better than the term 'Systematic Review' and the term 'Number Needed to Treat (NNT)' was also understood much better than 'Absolute Risk Reduction (ARR)'. 7% (17/234) reported that they knew the fictitious term. Readiness to learn was balanced between the two extremes: 37% (75/205) of respondents had no interest in learning (readiness to learn=0) whereas 33% (67/205) had a great interest (readiness to learn=1,0; i.e. they would like to understand every unknown term). Consistent with these findings, respondents attributed different importance to these terms in daily clinical practice: 10% (23/233) judged them as very important, 44% (102/233) rather important, 34% (79/233) rather unimportant, and 12% (29/233) as unimportant.

*Importance of journals.* Journals were judged by 26% (62/235) as very important for prescribing a new drug, 64% (150/235) found them rather important, and only 10% (23/235) considered them as rather unimportant. Only 41% (97/236) of respondents stated that the information provided by journals is sufficient enough to prescribe a new drug for the first time.

## Discussion

*Methodological issues.* Because the selection of the sample was not randomised, systematic biases are possible. As the available demographic characteristics of all German diabetologists were limited, an assess-

ment of the representativity of the sample is restricted. Differences in the rates of speciality can be considered as biased (Table 1) but as a relationship between speciality and specific responses has not been found (checked for eight items; data not shown) it is not clear if this is relevant for the results of the survey. Although the response rate lies below the average of other surveys [30, 31] no major differences in the four available demographic characteristics could be detected between the respondents and the sample (Table 1). The relatively higher rate of undeliverable questionnaires among hospital-based physicians is certainly negligible since the number of persons was too small. Non-response bias is another problem as indicated by the differences between the respondents and non-respondents (Table 2) but its relevance seems also questionable because associations between specific responses and sex, work place, or location of work place were not conclusive (checked for eight items; data not shown). Nevertheless these facts suggest that caution should be used when generalising the results.

Certain limitations lie in the methodology of surveys themselves. This sort of study is susceptible to a series of biases and inaccuracies if conclusions about the actual habits of respondents are drawn [32, 33]. Literature about response biases of physicians is limited and inconclusive [34, 35, 36, 37] and studies about inaccuracies in surveys of CME habits do not exist yet. At present about 10% of responses seem inaccurate. This can be estimated at the rate of respondents who knew the McNemar-Quality-Scale and the higher rate (11%) of respondents who could explain the term 'Number Needed to Treat' in comparison with 'Absolute Risk Reduction'. Therefore all rates or numbers in surveys should be interpreted as trends rather than at face value.

*Interpretation of findings.* Despite these limitations this study can add substantial information on reading habits and information management of diabetologists.

*Therapeutic decision making.* The large number of factors which were perceived important in guiding therapeutic decisions confirms previous studies on decision making. These studies showed that therapeutic decision making can not be explained by simple models but is a consequence of complex interactions of different factors [38]. The importance of industry related factors might be underestimated because previous studies showed that physicians often underestimated their influence [39]. The high rate of respondents who do not involve patients in their therapeutic decisions is remarkable but seems realistic [40]. Further efforts are needed to promote shared (and informed) decision making because involvement of patients is not only an ethical obligation but also required for an optimal treatment and the compliance of patients [41, 42, 43, 44, 45].

*Use of databases.* Although 90% of respondents had a relatively convenient access to medical databases, only 45% use them regularly, comparable to another study [46]. However, effort was reported to be the most important barrier for not conducting database searches. This suggests that other inconveniences are prevailing (e.g. databases might not be user-friendly enough). Developments like the "Clinical Queries" by the National Library of Medicine (http://www.ncbi.nlm.nih.gov:80/entrez/query/static/clinical.html) might help to overcome these problems. Still, they do not seem to be convenient enough because database users do searches only about three times a month though "information needs arise regularly when doctors see patients" [47] and these needs can be met to a relevant proportion by the literature [48, 49]. Besides the problem of handling a database, the relatively low rate of journals read in English could indicate that language barriers are another reason [50].

*Reading habits.* The time spent on reading journals is comparable with the results of previous studies but the number of journals read regularly was 25% to 30% higher among German diabetologists [24, 25, 28, 29, 51]. The rate of physicians who read journals in English seems low but it is also comparable to a previous study among general internists [29]. As most of the important advances in medicine are reported in journals written in English [52, 53], efforts should be made to increase this rate – either by translating English language publications or by promoting and offering language courses (preferably to medical students at the beginning of their undergraduate studies already).

As the accuracy and sufficiency of abstracts [54, 55] and discussion sections [56, 57] are not satisfying, the reported procedure when reading an article is of concern especially because of the high rate of respondents who read the abstract and the discussion but do not read the methods. Though the implementation of structured abstracts has improved their quality [58] the possibility to improve their accuracy seems limited especially in smaller journals [59]. Therefore it should be emphasised that the role of an abstract is to inform the reader of the potential interest of an article [60] and that it can not substitute the critical appraisal of the whole article, especially with regard to decisions involving patients.

*Critical appraisal and knowledge of technical terms.* The low rate of respondents who read the methods section corresponds with their inadequate methods of appraising the scientific validity of research articles. The responses to this question are comparable to a previous study [23]. Experience and discussions with colleagues are necessary when reading journal articles but they can only complement a critical appraisal of the methods section to validate the scientific sound-

ness of an article. Such an appraisal is necessary because the proportion of inadequate methods in clinical research is still noteworthy [61, 62] and also for assessing the applicability of results to daily clinical practice. Such behaviour could be due to lack of time but the knowledge of technical terms suggests that it is also related to problems with the adequate appraisal of methods sections. Though the knowledge of technical terms of respondents seems better than that of general practitioners [27] it is not satisfying and their lack of knowledge of widely used terms (e.g. confidence intervals, odds ratios) is remarkable. The readiness to learn however, is encouraging and should guide further efforts for continuing medical education in the field of biostatistics and critical appraisal. But the relatively high proportion of respondents who attached little value to these technical terms in clinical practice suggests that such efforts should be incorporated in routine CME events rather than in the promotion of lectures or workshops especially dedicated to evidence-based medicine or critical appraisal.

*Importance of journals.* The importance of journals in continuing medical education was emphasized by the fact that 90% of respondents valued them as important for prescribing new drugs. Only a minority however, reported that they could rely solely on them when prescribing a new drug for the first time. These findings are in line with responses to other questions in this survey (Fig. 2, Table 3 ). Furthermore they correspond with studies about changing behaviour and diffusion of new drugs and show that journals can play an important role but are only part of a complex network of factors which influence the prescription of innovative drugs [1, 63, 64, 65].

*Conclusions.* This survey showed that self-reported reading efforts and critical appraisal skills of diabetologists are slightly higher compared with non-specialists. The results also suggest that important parts of the evidence-based medicine concept are still not incorporated in clinical practice. Since it is reasonable to presume that the integration of external evidence in clinical decision making is essential for better health care [66, 67] and this concept has been promoted widely in medical journals and special CME events, future efforts should be made to better incorporate evidence-based medicine concepts in general CME events, graduate, and undergraduate medical education.

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## Appendix

Because of limited space the questions are not presented in the original layout (Fig. 2).

**1. Please estimate the influence of the various factors quoted below on your therapeutic decision making (Therapy of diabetes):**

| | very strong | strong | rather strong | rather minor | minor | no influence | do not use |
|---|---|---|---|---|---|---|---|
| | 5 | 4 | 3 | 2 | 1 | 0 | |
| 1. Medical study (university education) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

2. Books; 3. Published trials in journals; 4. Reviews in journals; 5. Systematic reviews/meta-analyses in journals; 6. Advertisements in journals; 7. Technical literature from the pharmaceutical industry; 8. Published guidelines; 9. Guidelines/standards of the own hospital; 10. CME events; 11. Quality circles; 12. Own clinical experience; 13. Colleagues; 14. Sales representatives of the pharmaceutical industry; 15. Wishes and desires from patients

**2. By which of these factors quoted above do you hear of a new drug for the first time (not more than three numbers)?**

1: _____ 2: _____ 3: _____

**3. Do you use databases regularly?**

☐ Yes ☐ No

**If yes:** 1. How often?
_____ per month
2. How much time does it usually take?
_____ min.
☐ As long as I get satisfying results

**If no:** 1. The effort is to big.
☐ Yes ☐ No
2. I do not know databases.
☐ Yes ☐ No
3. The results, which I could get, are not satisfying.
☐ Yes ☐ No
4. Other reasons.
(free text)

**4. Where is your nearest internet access or MEDLINE/EMBASE search possibility located?**

☐ Own ward/surgery ☐ University library/other hospital library
☐ Library in the own hospital ☐ At home

**5. How much time do you spend for reading technical literature?**

Journals: _____ hours/week Books: _____ hours/week

**6. Which journals do you read regularly?**

☐ Arzneimitteltelegramm ☐ Internist ☐ Dtsch Med Wochenschr ☐ Deutsches Ärzteblatt ☐ Medical Tribune ☐ Münch Med Wochenschr ☐ N Engl J Med ☐ Diabetes und Stoffwechsel ☐ Exp Clin Endocrinol Diabetes ☐ others (free text)

**7. Which part of an article do you usually read?**

| | always | often | seldom | never |
|---|---|---|---|---|
| | 3 | 2 | 1 | 0 |
| 1. Title | ☐ | ☐ | ☐ | ☐ |

2. Abstract; 3. Introduction; 4. Methods; 5. Results; 6. Discussion

**Fig. 2.**

**8. When you read a research article related to a clinical problem, how do you evaluate its scientific validity?**

| | always | often | seldom | never |
|---|---|---|---|---|
| | 3 | 2 | 1 | 0 |
| 1. Compare with own experience | ☐ | ☐ | ☐ | ☐ |

2. Rely on the editors/peer reviewer process; 3. Depending on the authors; 4. Contact the authors; 5. Examine methods and statistics; 6. Discussion with colleagues; 7. Discussion with clinical experts (e.g. from a university hospital); 8. Discussion with methodological experts (e.g. a statistician)

**9. Please indicate your position to the following terms:**

| | do not know | do not know but would like to understand | knowledge but no understanding | some understanding | understand and could explain to others |
|---|---|---|---|---|---|
| 1. Systematic review | ☐ | ☐ | ☐ | ☐ | ☐ |

2. Meta-analysis; 3. Publication bias; 4. Relative risk reduction (RRR); 5. Absolute risk reduction (ARR); 6. Number needed to treat (NNT); 7. Intention-to-treat analysis; 8. McNemar-Quality-Scale; 9. Confidence interval; 10. Alpha-error/Type-I-error; 11. Beta-error/Type-II-error; 12. Positive predictive value; 13. Odds ratio

**10. How important is the handling of these terms for your daily clinical practice?**

| very important | rather important | rather unimportant | not important |
|---|---|---|---|
| 3 | 2 | 1 | 0 |
| ☐ | ☐ | ☐ | ☐ |

**11. Do you think the information provided in scientific journals is sufficient enough for prescribing new drugs?**

☐ Yes ☐ No

**12. How important are scientific journals for prescribing a new drug for the first time?**

| very important | rather important | rather unimportant | not important |
|---|---|---|---|
| 3 | 2 | 1 | 0 |
| ☐ | ☐ | ☐ | ☐ |

**13. Personal data:**

Categories: Year of graduation; Sex; Speciality; Work place; Location of the work place; weekly hours of work; proportion of diabetic patients

**14. How comprehensible was this questionnaire?**

| difficult | rather difficult | rather easy | easy |
|---|---|---|---|
| 4 | 3 | 2 | 1 |
| ☐ | ☐ | ☐ | ☐ |

**15. We would appreciate any comments from you:**

Response category: (free text)

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