Interdisciplinary CME: is the need evident? Results of the evaluation of CME articles in the Journal of the German Medical Association

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Abstract

Background. Medicine has become more and more specialised over the last decades, which in turn has increased the need for interdisciplinary information exchange. The aim of this study is to describe the extent of the need for interdisciplinary knowledge transfer in a contemporary medical specialist population. Methods. We analysed reading by medical specialty of 53 accredited continuing medical education (CME) articles published in Deutsches Ärzteblatt (“Journal of the German Medical Association”), which is available to all German physicians. Results. In all, 86,340 physicians participated 1,007,923 times by reading one or more of the 53 articles. In fewer than 50% of all cases, 89.5% of all participants read content belonging to their specialty (rated by self-assessment). The highest percentage of interdisciplinary use of print CME was found in the group of physicians working neither in ambulatory care nor in hospitals, that is, those physicians working in the public health area, with public authorities, etc. Linear regression analysis in the biggest group of specialists (internal medicine) showed a tendency for more interdisciplinary use in the group of younger participants, female physicians, and those working in ambulatory care. Conclusion. This study demonstrates a somewhat unexpectedly high interdisciplinary use of medical information from freely available CME articles. The extent of interdisciplinary use of information most probably reflects an individual need of similar magnitude. These findings should stimulate CME providers more often to plan interdisciplinary CME independent of the mode of presentation.

Keywords: interdisciplinary CME, CME in print media, needs assessment, German Medical Association

Introduction

Medicine has become more and more specialised during recent decades. This trend is evident from the increase in numbers of specialist qualifications. In Germany, for example, the number of recognised specialties rose from 27 in 1982¹ to 33 in 2013.² The number of subspecialties rose from 18¹ to 33,² and the numbers in a category called Zusatzbezeichnung (“additional qualification”) rose from 15¹ to 47.² On the European level 54 specialties were registered by the EU Commission in 2013.³ Differential diagnosis often involves disease entities dealt with by other specialties and thus constitutes a need for interdisciplinary continuing medical education (CME). Such cross-specialty CME may have increased in proportion to...
the increase of recognised specialties (not to mention un-official subspecialisations in the specialty itself, such as cardiologists further specialising in coronary interventions). For the purposes of this project, *interdisciplinary* is defined as medical content relevant to several medical specialties.

The need for interdisciplinary education can be met in various ways:

- Interdisciplinary presenters presenting to a mono-specialty audience. This approach has traditionally been taken by the organisers of mono-specialty congresses and editors of mono-specialty journals.
- An alternative approach is to integrate mono-specialty knowledge into an interdisciplinary editorial board, which occurs mainly on the local or regional level.\(^6\)^\(^5\)
- Presentation of content from various specialties to an interdisciplinary audience. The effectiveness of this approach is critically dependent on whether the learners will be reached by the method of information distribution, since the establishment of a new specialty has always led to the parallel establishment of specialty-specific logistics of information, such as a specialty conference, specialty journal, etc.

Thus, the concept and conduct of interdisciplinary CME have become more complex issues over time.

The aim of this study was to analyse the interdisciplinary pattern of use of CME presented in *Deutsches Ärzteblatt* (*Journal of the German Medical Association*; DA), since all German physicians receive DA.

**Methods**

DA publishes 44 issues per year and began accredited CME in the second half of 2004. This study is based on the 53 CME modules published between 1 January 2005 and 31 December 2008 in every fourth issue of DA. After exclusion of retired physicians and psychologists, there were 1,007,923 participations by 86,340 physicians left for analysis.

The choice of topics as well as authors for CME articles in DA is the responsibility of the editorial board. This board is made up of 31 people, whose qualifications cover nearly all specialties recognised in Germany.\(^6\)^\(^5\)

As a general principle, the topic of CME articles should always have the potential to raise interdisciplinary interest. Members of the editorial board propose topics in their own specialty and from which authors of the article(s) will originate. The content was prepared by authors from two specialties for thirteen of the articles and from three specialties for two articles. By tradition no definition of a target group is communicated to potential readers in order to prevent them being biased against reading an article because they do not belong to the target group.

Between 2005 and 2008, in order to be awarded CME points, participants had to answer 10 multiple choice questions (the pass mark was 70%) related to the content of the CME article and complete an evaluation form, both provided electronically.

The evaluation form asked for the following items (among others):

- Age
- Gender
- Specialty
- Position in the healthcare system (family physician, hospital physician, public health service, etc.)
- Whether the content of the CME module is part of the reader’s specialty qualification
- Rating of the quality of the content (from 1=excellent to 6=unacceptable, matching the German school marks system) (based on an agreement between DA and the North Rhine Chamber of Physicians; Christopher Baethge, personal communication)

All data were stored with a provider under contract with DA and exported to the first author on 31 January 2009. Analyses were carried out using SPSS 18.0.2

Data are shown as means, absolute frequencies, or percentages.

A regression analysis was performed to identify characteristics which might have an influence on the percentage of participations that were related to the participant’s own specialty content.

**Results**

**Age:** The quantitative representation of different age classes among the participants is shown Table 1.

**Gender:** Of the 86,340 physicians participating at least once 47,788 (55.3%) were male and 38,552 (44.7%) were female.

**Specialty:** The specialties representing more than 3% of the participants are shown in Table 2.

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### Table 1. Age of the participants.

| Age (years) | 2005–2008 |
|------------|-----------|
|            | N         | %   |
| <30        | 5,613     | 6.5 |
| 30–39      | 22,283    | 25.8|
| 40–49      | 32,814    | 38.0|
| 50–59      | 21,505    | 24.9|
| 60–64      | 3,415     | 4.0 |
| ≥65        | 710       | 0.8 |
| Total      | 86,340    | 100 |

### Table 2. Representation of specialties among readers.

| Specialty                        | 2005–2008 |
|----------------------------------|-----------|
| Internal medicine                | 20.0% (12.4%) |
| General medicine                 | 15.6% (17.0%) |
| Anaesthesia                      | 11.1% (7.0%) |
| Surgery                          | 8.6% (4.8%) |
| Gynaecology and obstetrics       | 5.4% (7.0%) |
| Childhood and adolescent medicine| 4.8% (5.5%) |
| Neurology                        | 3.8% (3.4%) |
| Psychiatry and psychotherapy     | 3.7% (2.7%) |
| Radiology                        | 3.2% (2.8%) |
| Orthopaedics                     | 3.1% (3.3%) |

Note: Figures in brackets refer to the percentages of active German physicians in the specialty on 31 December 2008.\(^7\)
Over the 4-year observation period fewer than 1% of participants belonged to the specialties of anatomy, laboratory medicine, biochemistry, or physiology. 

Current position: Of the 86,340 participants, 41.7% worked in ambulatory care, 45.7% in hospitals, 8.8% in other areas of healthcare (e.g. public health), and 3.8% were not working as physicians at the time. 

The 45.7% of participants working in hospitals included 30.9% residents, 12.3% senior specialists, and 2.5% heads of department.

Number of articles read: On average physicians participated in 11.7 (SD=13.0, 1–53 min–max) CME modules. The average number of articles read detailed by position in the healthcare system is shown in Table 3.

Because only those who began participating before 2008 had a reasonable chance of working on numerous CME modules, the following analysis is restricted to the 77,531 physicians who first participated before 2008. The data are shown in Table 4.

Table 3. Number of articles read by position in the healthcare system.

| Position in the healthcare system | 1–2 | 3–10 | 11–20 | >20 | Total |
|----------------------------------|-----|------|-------|-----|-------|
| Ambulatory care                  | 36,001 | 26,647 | 10,645 | 2,123 | 7,618 | 3,306 | 86,340 |
| Trainee                          | 11,65 | 9,95 | 13,42 | 11,51 | 15,93 | 10,47 | 11,67 |
| Senior specialist                | 1     | 1    | 1     | 1    | 1     | 1     | 1     |
| Minimum                          | 53    | 53   | 53    | 52   | 53    | 53    | 53    |
| Maximum                          | 13,17 | 11,52 | 13,64 | 13,07 | 15,08 | 12,43 | 13,01 |
| SD                               |       |      |       |      |       |       |       |

Table 4. Number of articles read (starting before 2008).

| Number of articles read (starting before 2008) | n | %   |
|------------------------------------------------|---|-----|
| 1                                              | 12,402 | 16.0 |
| 2–5                                            | 21,493 | 27.7 |
| 6–10                                           | 12,365 | 15.9 |
| 11–20                                          | 13,443 | 17.3 |
| >20                                            | 17,828 | 23.0 |
| Total                                          | 77,531 | 100  |

Table 5. Number of articles read by age.

| Age (years) | 1–2 | 3–10 | 11–20 | >20 | Total |
|-------------|-----|------|-------|-----|-------|
| <30         | 2,456 | 9.4 | 2,360 | 8.3 | 682 | 4.2 | 215 | 1.2 | 5,613 | 6.5 |
| 30–39       | 7,398 | 28.2 | 8,334 | 29.1 | 3,410 | 24.9 | 3,141 | 17.6 | 22,283 | 25.8 |
| 40–49       | 9,298 | 35.5 | 10,388 | 36.3 | 5,568 | 40.7 | 7,560 | 42.4 | 32,814 | 38.0 |
| 50–59       | 5,844 | 22.3 | 6,271 | 21.9 | 3,539 | 25.8 | 5,851 | 32.8 | 21,505 | 24.9 |
| 60–64       | 988 | 3.8 | 1,036 | 3.6 | 497 | 3.6 | 894 | 5.0 | 3,415 | 4.0 |
| ≥65         | 240 | 0.9 | 204 | 0.7 | 99 | 0.7 | 167 | 0.9 | 710 | 0.8 |
| Total       | 26,224 | 100 | 28,593 | 100 | 13,695 | 100 | 17,828 | 100 | 86,340 | 100 |

Table 6. Number of articles read by gender.

| Gender | 1–2 | 3–10 | 11–20 | >20 | Total |
|--------|-----|------|-------|-----|-------|
| Male   | 14,977 | 31.3 | 15,672 | 32.8 | 7,382 | 15.4 | 9,757 | 20.4 | 47,788 | 100 |
| Female | 11,247 | 29.2 | 12,921 | 33.5 | 6,313 | 16.4 | 8,071 | 20.9 | 38,552 | 100 |
| Total  | 26,224 | 30.4 | 28,593 | 33.1 | 13,695 | 15.9 | 17,828 | 20.6 | 86,340 | 100 |

Table 7. Number of articles read by position in the healthcare system.

| Position in the healthcare system | 1–2 | 3–10 | 11–20 | >20 | Total |
|----------------------------------|-----|------|-------|-----|-------|
| Ambulatory care                  | 11,586 | 44.2 | 11,309 | 39.6 | 5,589 | 40.8 | 7,517 | 42.2 | 36,001 | 41.7 |
| Trainee                          | 8,474 | 32.3 | 9,918 | 34.7 | 4,064 | 29.7 | 4,191 | 23.5 | 26,647 | 30.9 |
| Senior specialist                | 2,671 | 10.2 | 3,380 | 11.8 | 1,933 | 14.1 | 2,661 | 14.9 | 10,645 | 12.3 |
| Department head                  | 685 | 2.6 | 671 | 2.3 | 338 | 2.5 | 429 | 2.4 | 2,123 | 2.5 |
| Other areas of healthcare        | 1,672 | 6.4 | 2,190 | 7.7 | 1,322 | 9.7 | 2,434 | 13.7 | 7,618 | 8.8 |
| Currently not working as a physician | 1,136 | 4.3 | 1,125 | 3.9 | 449 | 3.3 | 596 | 3.3 | 3,306 | 3.8 |
| Total                            | 26,224 | 100 | 28,593 | 100 | 13,695 | 100 | 17,828 | 100 | 86,340 | 100 |
Tables 5–8 show the number of articles read in relation to age, gender, position in the healthcare system, and learners’ specialty.

Interdisciplinary use of CME articles: Number of participants per article varied from 13,704 to 25,386. The overall educational quality was rated as good (i.e. 2 according to the German system of school marks), which corresponds to the finding that in 99% of all cases the participants exceeded the pass mark of 70% of correctly answered multiple choice questions. The percentage of participants classifying the content as part of their specialty qualification ranged from 0 to 39% per article. In all, 44,037 (51%) physicians never read an article related to their specialty, while 49% read at least one related to their specialty and 5,587 (6.5%) physicians participated exclusively in those CME modules related to their specialty (see Table 9). In the vast majority of participants (89.9%) participation mostly occurred in articles not related to their specialty (i.e. fewer than 50% of the participations occurred in articles related to their specialty).

Figure 1 shows the percentage of articles read in the four biggest specialties of participants. Figures 2 and 3 show the proportion of articles read in each specialty broken down by age (subdivided by gender) and position in the healthcare system, respectively.

As analysed by gender, the mean proportion of articles read as related to specialty content was 16.5 for female participants and 18.9 for male participants.

Regression analysis: Because the articles were not uniformly distributed across all specialties, which might have biased choices to read an article (see Table 10), we restricted our multivariate analysis to participants belonging to the specialty of internal medicine who were active in patient care (n=15,533) (Tables 10–12).

On average specialists in internal medicine read articles relating to their own specialty in 41.7% of cases.

Age, gender, reading time (including answering of the multiple choice questions), educational quality, and whether the participant worked in a hospital vs. in the ambulatory sector all showed statistically significant influence on reading behaviour.

Though these effects showed statistical significance (due to the large number of participants), the linear regression

| Table 8. Number of articles read by medical specialty. |
|------------------------------------------------------|
| Specialty                                      | 1–2   | 3–10  | 11–20 | >20   | Total |
|                                               | n     | %     | n     | %     | n     | %     | n     | %     | n     | %     |
| Internal medicine                             | 5,424 | 20.7  | 5,893 | 20.6  | 2,354 | 17.2  | 2,692 | 15.1  | 16,363 | 19.0 |
| General medicine                              | 4,665 | 17.8  | 4,295 | 15.0  | 1,954 | 14.3  | 2,584 | 14.5  | 13,498 | 15.6 |
| Anaesthesia                                   | 2,042 | 7.8   | 2,945 | 10.3  | 1,740 | 12.7  | 2,698 | 15.1  | 9,425  | 10.9 |
| Surgery                                       | 1,926 | 7.3   | 2,262 | 7.9   | 1,119 | 8.2   | 1,346 | 7.5   | 6,653  | 7.7  |
| Gynaecology and obstetrics                    | 1,623 | 6.2   | 1,559 | 5.5   | 702   | 5.1   | 803   | 4.5   | 4,687  | 5.4  |

| Table 9. Percentage of participants with more than one participation classifying the content as being part of their medical specialty qualification. |
|-------------------------------------------------------------------------------------------------------------------------------------|
| Proportions | n | % |
| 0%         | 44,037 | 51.0 |
| 1–25%      | 21,045 | 24.4 |
| 26–50%     | 12,496 | 14.5 |
| 51–99%     | 3,175  | 3.7  |
| 100%       | 5,587  | 6.5  |
| Total      | 86,340 | 100  |

Figure 1. Proportion of articles read as related to specialty content for the four biggest groups (i.e. specialties) of participants.

Figure 2. Proportion of articles read as related to specialty content by age (subdivided by gender).

Figure 3. Proportion of articles read as related to specialty content by position in the healthcare system (subdivided by gender).
also showed that a large part of the variation could not be explained by these variables.

However, the effect of age was rather low. An increase of 10 years in participants’ age predicted a reduction in the percentage of articles read in their own specialty by 0.2%. An increase of reading time by one category reduced this percentage by 2%, and each poorer mark for educational quality by 3%. Being male increased the percentage of articles read in participants’ own specialty by 3% compared to being female, and working in a hospital by 7% compared to physicians working in ambulatory care.

Discussion

In Germany, every licensed physician has to be a member of one of the nationwide 17 chambers of physicians and all members of the chambers of physicians get DA on a weekly basis, which is covered by the membership fee for the chamber. This arrangement offers a unique opportunity to come to a realistic estimate of the need for interdisciplinary CME by analysing the patterns of use of accredited CME content in DA. DA has included CME content for many years, but accredited CME including mandatory evaluation started only after CME became mandatory by law in 2004 in Germany.

The main finding of this study is that the vast majority of participants in this type of print CME worked mostly on content not related to their own medical specialty. This finding is supported by the fact that about 30% of the CME articles were originally intended to be read by more than one specialty.

These values are much higher than for interdisciplinary use of CME in specialty journals, which varies between 0.9 and 3.0% for the specialties of internal medicine, anaesthesia, paediatrics, and ophthalmology. The reason for the difference is that these journals are mainly read by members of their respective specialties and non-subscribers are charged by the provider for each article read (Martina Siedler, personal communication, Springer Verlag, Heidelberg).

There was a tendency for more interdisciplinary use among the younger participants, female physicians, and those working in ambulatory care.

The highest percentage of interdisciplinary use of print CME was found among the physicians working neither in ambulatory care nor in hospitals, but rather in the public health area, with public authorities, etc. This group often have to deal with a great variety of disease conditions on a theoretical or administrative level, but lack direct patient contact, which might explain the high need for interdisciplinary knowledge transfer.

Furthermore, these findings may point to the fact that currently there is not enough interdisciplinary CME provided by specialty journals or by the programmes of specialty societies’ congresses.

Because this situation would have considerable implications for CME providers and would lead to more deliberately planned interdisciplinary CME, these findings should be discussed in relation to potential confounders.

There are a number of factors, which might have led to over- as well as underestimation of the need for interdisciplinary information transfer.

Though participation of physicians by specialty was roughly proportional to the representation of the specialty among all active physicians in Germany (see Table 2), it cannot be excluded that there might be specialties with a higher or lower need for interdisciplinary knowledge transfer.

Because only about one-third of all active physicians in Germany participated at least once in the CME offered by DA (between 2005 and 2008), it may well be that there are other members of a given specialty with a higher or lower need for interdisciplinary knowledge transfer.

Although we analysed 53 CME modules, they were not uniformly distributed over all medical specialties and it
might well be that there are other topics with higher or lower involvement of non-specialist learners.

The need for interdisciplinary information transfer may also be dependent on workplace availability of interdisciplinary information. Thus, our findings may in part be due to the specific structure of the German healthcare system, with 43% of all active physicians working exclusively in the ambulatory sector, of whom 44.7% are currently working in a solo practice. This situation may have led to overestimation of the need for interdisciplinary CME compared to other countries.

Since 2004 every physician in Germany licensed for reimbursement from the statutory health insurance companies has had to give proof of his or her CME activities by collecting 250 CME points over 5 years in order to be awarded the CME certificate of the chambers. This requirement might have stimulated unselective reading. However, the fact that mean participation frequency was 11.7 articles (22% of all articles analysed) does not support this view. Similar findings have been published from evaluation of CME articles in specialty journals.

Because we asked only about the main specialty of participants (and not about potential additional qualifications) the need for interdisciplinary CME might have been overestimated.

Overall the educational quality of the articles was rated as good (i.e. 2 according to the German system of school marks) and passing rates were at least 99%, which corresponds with previously reported findings.

In conclusion, our study shows an unexpectedly high interdisciplinary use of medical information resulting from the active provision of CME articles freely accessible to German physicians. The extent of interdisciplinary use of information probably reflects individual needs of similar magnitude. These findings should motivate CME providers to plan more interdisciplinary CME independent of the mode of presentation.

Conflict of interest and funding

Prof Baethge declares that he is an employee of Deutscher Ärzteverlag/Deutsches Ärzteblatt. Dr Christ, Prof Lehmacher, Dr Lösche, and Prof Griebenow do not have any financial interests to declare.

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