

Osteopathy in Germany: attitudes, beliefs and handling among general practitioners – results of a nationwide cross-sectional questionnaire survey

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Research Article

Keywords: Osteopathic Medicine, General Practice, Osteopathic Manipulative Treatment, Complementary Alternative Medicine

Posted Date: May 5th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-424591/v1>

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33 **Abstract**

34 **Background:** Osteopathy is a type of complementary medicine based on specific manual techniques.

35 In many countries, including Germany, the profession is not officially regulated, and evidence for the
36 effectiveness of osteopathy is insufficient for most diseases. Nevertheless, many health insurances in
37 Germany offer reimbursement for therapy costs, if osteopathy is recommended by a physician.

38 This cross-sectional survey of German general practitioners (GPs) explored beliefs and attitudes
39 towards osteopathic medicine and described their daily interactions with it.

40 **Methods:** A random sample of 1000 GPs from all federal states was surveyed by mail using a self-
41 designed questionnaire. We collected data on sociodemographics, personal experiences with
42 osteopathy, and attitudes and expectations towards osteopathy. In particular, participants were asked
43 about indications for osteopathic treatment and their beliefs about its effectiveness for different
44 patient groups and diagnoses. A self-designed score was used to estimate general attitudes towards
45 osteopathy and identify factors correlated with greater openness. Additionally, we performed logistic
46 regression to reveal factors associated with the frequency of recommending osteopathy to patients.

47 **Results:** Response rate was 34.4%. 46.5% of participants were women, and the median age was 56.0
48 years. 91.3% of GPs had referred patients to an osteopath, and 88.0% had recommended osteopathy
49 to their patients. However, 57.5% acknowledged having little or no knowledge about osteopathy. Most
50 frequent reasons for a recommendation were spinal column disorders (46.2%), other complaints of
51 the musculoskeletal system (18.2%) and headaches (9.8%). GPs estimated the highest benefit for
52 chronically ill and middle-aged adults. Female gender (OR 2.09; 95%CI 1.29-3.38) and personal
53 treatment experiences (OR 5.14; 95%CI 2.72-9.72) were independently positively associated with more
54 frequent treatment recommendation.

55 **Conclusion:** GPs in Germany have frequent contact with osteopathy, and the vast majority have
56 recommended osteopathic treatment to some extent in their practice, with foci and opinions
57 comparable to other Western countries. The discrepancy between GPs making frequent referrals for

58 osteopathic treatment while self-assessing to have little knowledge about it demonstrates need for
59 intensified research on the collaboration with osteopaths and how to best integrate osteopathic
60 treatments. Our results may help to focus future effectiveness studies on most relevant clinical
61 conditions in general practice.

62 **Keywords:** Osteopathic Medicine, General Practice, Osteopathic Manipulative Treatment,
63 Complementary Alternative Medicine

64

65 **Background**

66 Osteopathy, also referred to as osteopathic medicine or osteopathic manipulative treatment (OMT),
67 is a complementary medicine with its own philosophy, methods of diagnosis and manual therapy.
68 Focus is placed on the human body unity, determined by autoregulation and the interactions of
69 anatomy and physiological function. The treatment method was founded by US-American physician
70 and preacher Andrew Taylor Still in the late 19th century and spread from there to Europe and many
71 other parts of the world [1].

72 The regulation for the profession "Osteopath" is diverse among European countries. While in Great
73 Britain, France, Switzerland, Portugal and Belgium osteopathy is approved and regulated by the state
74 [2, 3], in Germany there is no legally protected professional title and no uniform training or curriculum
75 exists. Nevertheless, with around 10,000 osteopaths and more than 10 million patient contacts per
76 year, osteopathy is an recognizable economic and financial part of the health sector [4]. Osteopathy in
77 Germany legally has been defined as a medicine system that can only be applied legally by physicians
78 or state-approved alternative practitioners ("Heilpraktiker"). However, osteopathy is not accredited as
79 official additional training for physicians in Germany. Physiotherapists may only treat patients with
80 osteopathic techniques when prescribed by a physician, although they cover a large part of the
81 osteopathic treatment [5]. Osteopathic training mostly takes place at private schools or universities

82 that are partially and voluntarily supervised through associations of osteopaths or alternative
83 practitioners. The curricula and the extent of training hours show a high variation among schools.

84 External evidence for the effectiveness of osteopathic treatment is scarce for most indications not
85 directly related to musculoskeletal problems of the spine (e.g., low backpain) and often has
86 methodological problems [6].

87 Many German health insurances reimburse the costs for osteopathic treatment partially, if a physician
88 recommends this kind of treatment [7]. General practitioners (GPs) are often the first professional
89 contact for patients seeking osteopathic treatments and are thereby confronted with questions
90 towards indications, effectiveness and safety. However, there is little data and knowledge of the
91 relationship and views of German GPs on osteopathy.

92 The present study explored the knowledge, beliefs and attitudes among German GPs towards
93 osteopathy, as well as their experience with osteopathy in practice. The study also aimed to identify
94 associations between sociodemographic, job-related and experience-based variables which could
95 influence the treatment recommendation for osteopathy. In addition, reasons for referral and
96 expectations of benefit for selected patient groups and treatment occasions were investigated.

97

98 **Methods**

99 **Sampling and design**

100 A cross-sectional survey of a random sample of 1000 GPs across Germany was performed. The sample
101 size was calculated based on a number of 45,467 GPs working in Germany in 2019 [8], aiming for a
102 level of confidence of 95% and a precision of 5%. Assuming a response rate of 30 to 40%, we contacted
103 1000 GPs by mail. Numbers of selected GPs for each federal state were balanced to the number of
104 respective practicing GPs based on 2018 figures of the Associations of Statutory Health Insurance
105 Physicians (Kassenärztliche Vereinigungen). From 200 randomly chosen postal codes, five GPs having

106 their practice in the respective area were selected by random draw from publicly available registers. If
107 there were fewer than five GPs registered, the missing addresses were taken from another random
108 postal code of the same state.

109 In February 2019, selected GPs were mailed the questionnaire, as well as a formal cover letter
110 containing information about the study and a privacy statement. After two months, a reminder was
111 sent. No incentives were offered. The survey was closed for evaluation in July 2019. Participation in
112 the study was voluntary, and completed questionnaires were returned by fax or mail. The detailed
113 sampling process is shown in Figure 1.

114 **Questionnaire**

115 The questionnaire was self-designed with the input and expertise of an interdisciplinary research team
116 consisting of experienced GPs and physicians (one with additional expertise in osteopathy), a social
117 scientist and a medical student. An unsystematic literature search using the keyword "osteopathic
118 treatment" was performed in Medline/Pubmed and the Cochrane Library considering the number of
119 publications found for specific diseases. Positive or negative effect ratings were not considered. This
120 search identified the 15 most frequently mentioned treatment occasions that should be rated by the
121 participants regarding expected benefit of osteopathic treatment. To ensure comprehensibility and
122 face validity, the questionnaire was pre-tested by 8 GPs, including subsequent feedback discussions.
123 After minor modifications, the final version contained 55 items and could be completed in five to ten
124 minutes. An English translation of the questionnaire is provided in Additional File 1.

125 **Data collection and statistical analyses**

126 Returned questionnaires were scanned and read out using the software Form Pro 3.0 (OCR Systems,
127 Germany). Collected data was cleaned, and the free text answers were added manually. Statistical
128 analyses were performed using IBM SPSS Statistics 24 for Windows. Frequencies were presented as
129 %_{valid} ($n_{\text{absolute}}/n_{\text{valid}}$), continuous variables as mean \pm standard deviation (SD). We categorized the open
130 text diagnoses into subcategories with different levels of specification, depending on related clinical

131 pictures. The outcome variable and key question "Have you ever recommended treatment by an
132 osteopath to a patient?" was coded binary (0=in a few cases/no, never; 1=yes, regularly/occasionally).
133 The response options were subjective without numerical specifications for the frequency of
134 recommendation. Univariable and multivariable binary logistic regression was used as the primary
135 analysis to estimate predictive factors of recommendation behavior (dependent variable) including
136 95% confidence intervals (95% CI). After selecting variables based on content to include in the analysis,
137 individual tests of the items to exclude multicollinearity were undertaken. Reasons for exclusion were
138 correlation of two variables $r > 0.6$, variable categories with a total of $n < 10$ respondents, generally
139 high rate of missing answers for single questions ($n < 300$) and $p > 0.5$ in the following Chi-square tests.
140 Covariates gender (men vs. women), age (< 40 vs. ≥ 40), personal treatment experience (yes vs. no)
141 and knowledge (very good/good vs. little/no) were investigated as independent predictor variables. In
142 an exploratory approach, backward LR/stepwise and forward LR/stepwise sensitivity analyses were
143 performed.

144 To estimate the general attitude and the subjective appraisal towards osteopathy, we used five
145 questions of the questionnaire and created a score to summarize this general view of GPs. For each
146 question, a value between 0 (rather skeptical) and 3 (rather open-minded) was assigned to generate a
147 total score. A higher score represents a more positive attitude towards osteopathy. Linear regression
148 (stepwise) explored the relationship between this score and selected predictor variables as above.

149

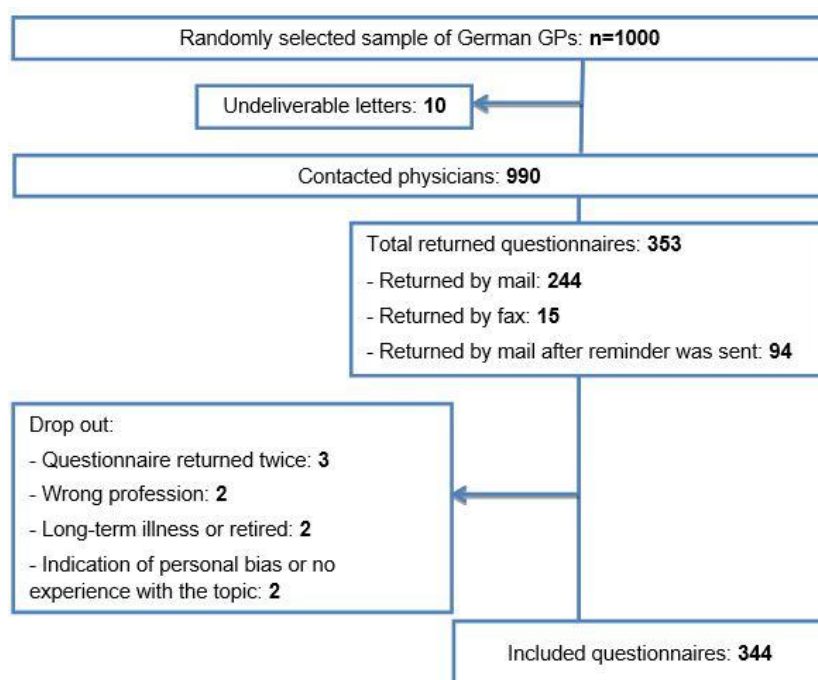
150 **Results**

151 **Descriptive analysis**

152 *1) Response*

153 The response rate was 34.4%, with 344 (of 1000) analyzable data sets. Figure 1 shows a flow chart with
154 details about returned questionnaires and reasons for exclusion. Response rate was heterogeneous,

155 with the highest rates in the federal states Saxony, Schleswig-Holstein and Thuringia (44.6 to 50.0%)
 156 and lowest rates in Hessen (24.6%) and North Rhine Westphalia (26.2%).



157

158 **Fig. 1** – Sampling flow chart

159

160 2) Sociodemographics and job-related characteristics

161 Of the respondents, 46.5% were women. The mean age was 54 ± 9.5 years (Median 56.0, range 30-
 162 80). 64.5% of the GPs had at least one additional qualification, while only 4 out of 344 (1.2%) had
 163 extensive training in osteopathy. Table 1 shows a summary of sociodemographics and comparable data
 164 of all German GPs, available from publicly accessible registers [9].

165

166 **Table 1** Sociodemographic and job-related factors - total sample compared to all German GPs in %

Variable	All participating GPs in % (n/nvalid)	All German GPs in %
Female	46.5 (160/344)	45.9
Age in years (mean \pm SD)	54.8 \pm 9.5, Median: 56.0	55.5

177 The majority of GPs surveyed (77.6%) personally knew an osteopath working in the catchment area of
178 their practice, and of these GPs, 57.1% had collaborated with them. The questions addressing
179 cooperation quality revealed that 42.9% of GPs exchanged medical findings with their local osteopath.
180 The majority of GPs considered the information exchanged comprehensible (74.2%) and useful for
181 treatment (64.9%). Willingness to cooperate with osteopaths was present in two-thirds (67.8%) of the
182 doctors. More than one-third of GPs (39.4%) received patients sent by an osteopath. Furthermore,
183 33.7% of all GPs had been treated by an osteopath themselves. Almost two-thirds knew a qualified
184 osteopath whom they would recommend to patients.

185 When asked about the general feedback given by patients after osteopathic treatment, 69.0% of
186 doctors reported receiving overall positive feedback. 22.7% of respondents indicated they received
187 heterogeneous feedback, and only 2.7% emphasized that they received negative feedback. 5.7% of
188 GPs indicated they did not receive patient feedback after osteopathic treatment.

189

190 *4) Knowledge*

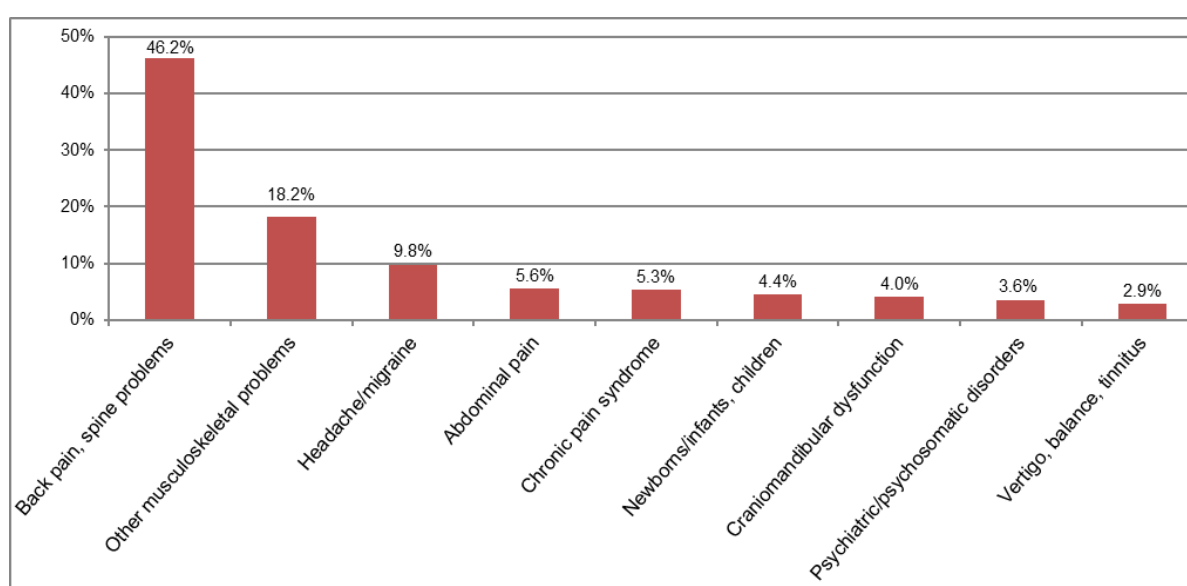
191 Reported subjective responses on knowledge were widely divergent, from self-perceived very well-
192 informed (7.6%) and good knowledge (34.6%) to little (52.6%) and almost no expertise (4.4%) in
193 osteopathy. From n=628 submitted replies (multiple answers were possible), personal narratives
194 (38.1%) and medical journals (28.2%) were the highest rated sources of information. Internet (7.8%),
195 non-medical journals (5.1%), training/further education or congresses (4.1%) and exchange with
196 colleagues or patients (2.9%) followed. Additionally, 17.7% of GPs stated that they have little or no
197 information on the subject of osteopathy at all.

198 Nearly three-quarters (72.2%) of GPs were aware of which medical professions are allowed to practice
199 osteopathy in Germany.

200

201 5) *Treatment occasions and patient spectrum*

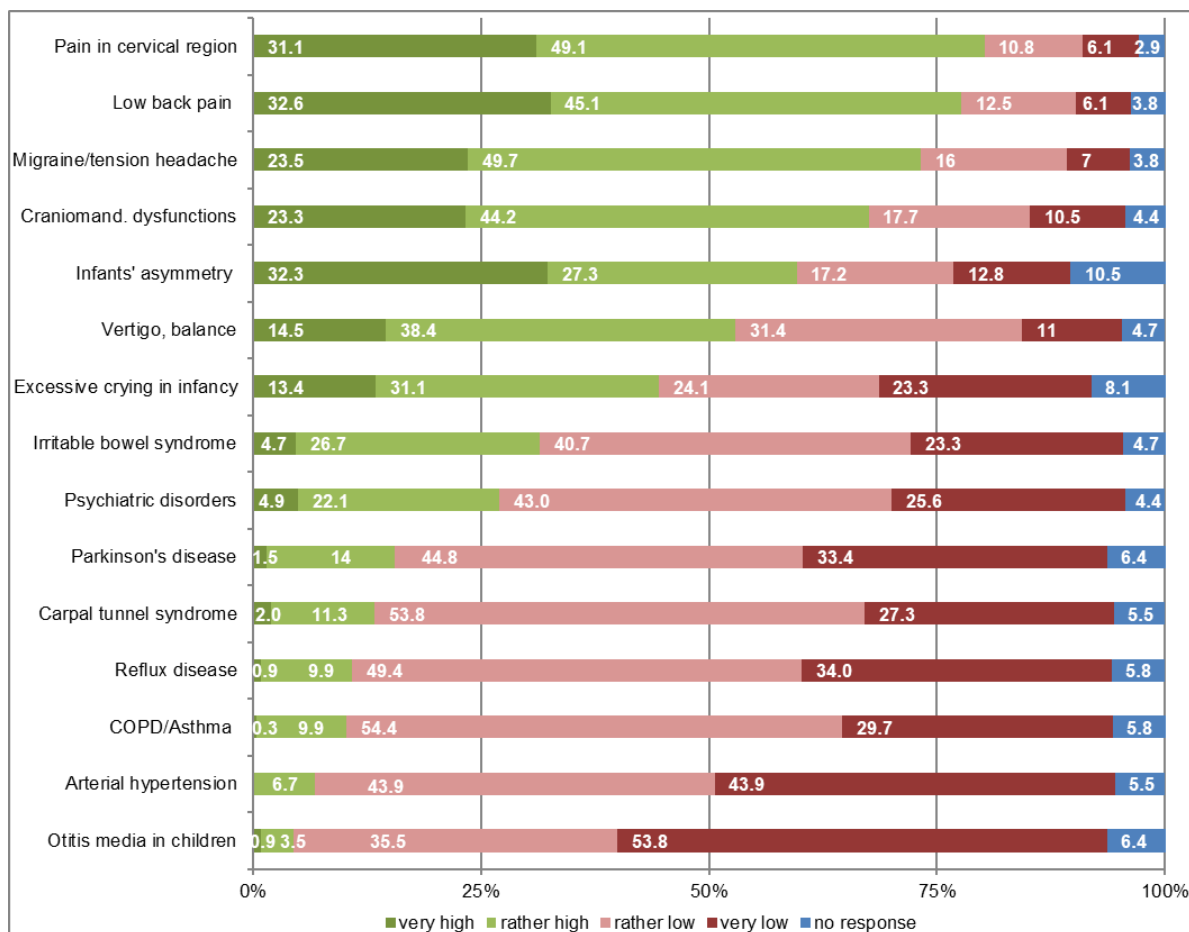
202 When asked for the most frequent reason for recommendation of osteopathy, in total 629 reasons for
 203 encounter were mentioned and clustered into nine categories. The most frequent reasons listed were
 204 back pain and complaints concerning the spinal column (cervical/thoracic/lumbar spine, sacroiliac
 205 joint, discus prolapse). Other treatment occasions that could not be assigned to any of the selected
 206 categories (n=20; e.g., dysmenorrhea, scar pain, post-traumatic or postoperative treatment, insomnia,
 207 heart complaints) are not mentioned in the detailed percentages (Fig. 2).



208
 209 **Fig. 2** – Open text reasons for encounter of most likely recommended clinical pictures for osteopathic
 210 treatment in % (n=450)

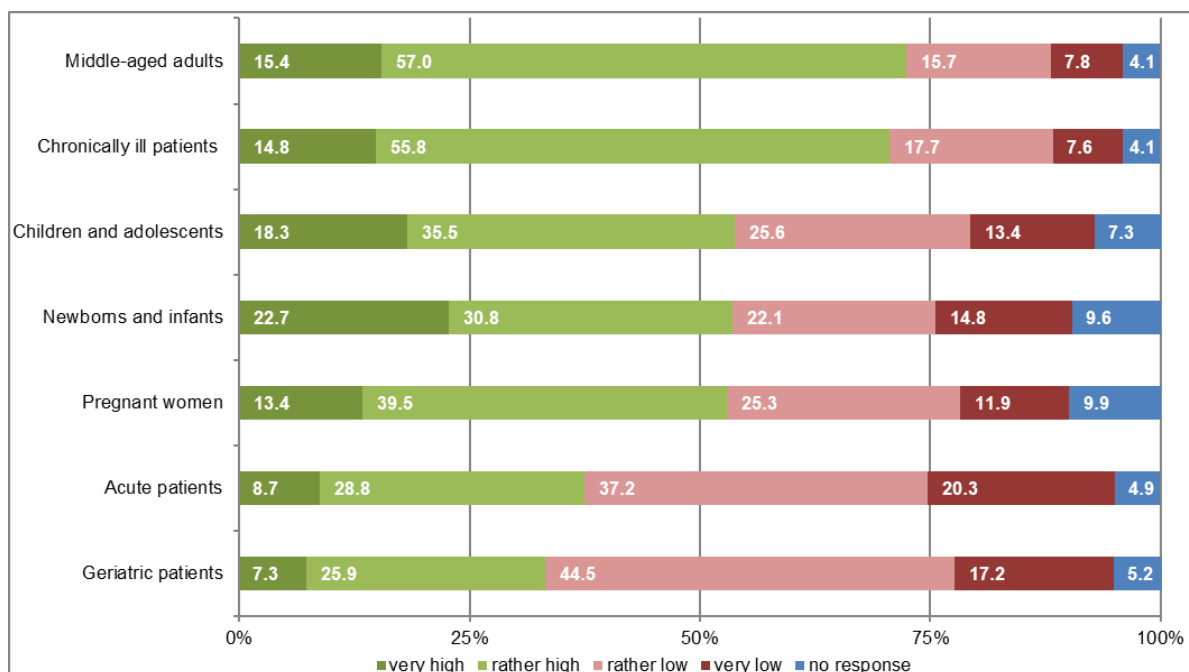
211 Asked for the most promising conditions for osteopathic treatment, physicians rated musculoskeletal
 212 causes the highest, in line with the open-text answers. Complaints associated with the inner organs
 213 were faced with lower expectations (Fig. 3). Middle-aged and chronically ill patients were attributed
 214 the biggest benefit for OMT (Fig. 4). Female GPs had a significantly higher expectation of benefit
 215 assessment than male GPs in 9 of 15 clinical pictures and 4 of 7 patient groups.

216



217

218 **Fig. 3** – Expectations of benefit from osteopathic treatment for different pre-selected reasons for
 219 encounter via GPs self-assessment in % (n=344)



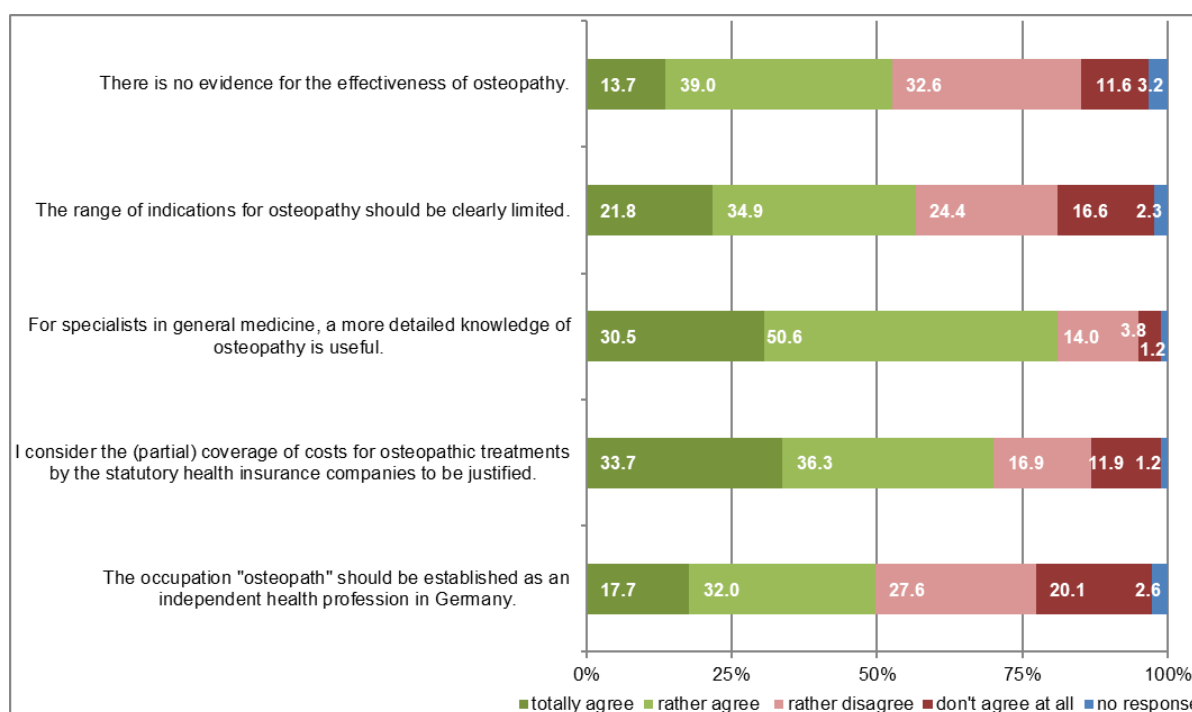
220

221 **Fig. 4** - Expectations of benefit from osteopathic treatment for different patient groups via GPs self-
 222 assessment in % (n=344)

223

224 *5) Opinions on scientific and political issues of osteopathy*

225 GPs were asked about five current issues of debate concerning osteopathy in respect to the evidence
 226 base, need for information, reimbursement by health insurance companies, limitation of indications
 227 and establishment of a distinct health profession (Fig. 5).



228

229 **Fig. 5** – “How do you agree with the following statements?” answers in % from all GPs (n=344)

230

231 **Opinion score**

232 With n=321 GP included, we have scored the "opinion score" by five questionnaire items with a
 233 standard distributed outcome (mean value 8.3 points \pm 3.5, range 0-15). This serves as an attempt to

234 represent approval and rejection of the treatment method osteopathy. No multicollinearity (> 0.7)
235 could be detected between the five questions.

236 When correlating the items already examined in the cross table with the opinion score, a clear
237 association with gender ($p = 0.004$), knowledge, patient feedback, self-treatment, and knowing a
238 locally based and qualified osteopath (all $p < 0.001$) for a higher opinion score was shown. Correlation
239 to age, additional qualification and the federal state could not be found.

240 Notably, multivariate regression showed higher attitude score in physicians with former self-treatment
241 ($p < 0.001$; regression coefficient 2.78, 95%CI 1.97-3.57). GPs, who have already been treated
242 themselves, are more open-minded towards osteopathy. State and gender also remained as
243 influencing variables.

244

245 **Associations with treatment recommendations**

246 Results of bivariate associations are presented as absolute and relative numbers from the selected
247 items in Additional File 2. Female practitioners (OR 2.09; 95%CI 1.29-3.38) more frequently
248 recommended osteopathic treatment. GPs who know a local (OR 4.11; 95%CI 2.43-6.96) and qualified
249 (OR 6.94; 95%CI 4.14-11.64) osteopath recommended OMT more often, as well as GPs who have been
250 treated themselves (OR 5.14; 95%CI 2.72-9.72). Furthermore, more frequent treatment
251 recommendation was positively associated with good feedback from patients (OR 7.26; 95%CI 4.31-
252 12.22) and knowledge of the GP about osteopathy (OR 1.91; 95%CI 1.17-3.10). No significant
253 association could be found with age, additional qualification, or catchment area and structure of the
254 practice. GPs without doctorates degree or habilitation recommended OMT more often than GPs who
255 held these scientific qualifications.

256 Four covariates were preselected for multivariate analyses and analyzed on the basis of 302
257 questionnaires (87.8% of all GPs) with complete answers. Multivariable analysis predicting self-

258 assessed occasionally or regularly (vs. few cases or no, never) recommendation of osteopathy revealed
259 positive associations for physicians with own treatment experience (88.3% vs. 59.5%; OR 5.44; 95% CI
260 2.77-10.70). Furthermore, female physicians seem to prefer osteopathic treatment (77.7% vs. 62.5%;
261 OR 1.62; 95% CI 0.94-2.82). These results were confirmed in the sensitivity analysis.

262

263 **Responder and non-responder analyses**

264 No difference was stated between response and gender ($p=0.229$), GPs practicing in former Eastern or
265 Western Germany ($p=0.094$) and academic degree of GPs (see Table 1).

266 Non-response rate among female and male GPs was 63.8% and 67.0%, respectively. Considering GPs
267 in former Eastern and Western Germany, this rate was 56.9% and 67.8%. There was no difference in
268 the frequency of academic degree for responders (64.3%) and non-responders (64.0%).

269

270 **Discussion**

271 Osteopathy seems to be a well-known topic for German GPs, as nearly all respondents had already
272 given written recommendation for an osteopathic treatment to their patients. More than three-
273 quarters of all respondents knew an osteopath near their practice, two-thirds could imagine
274 cooperation, almost two-thirds could name an osteopath they would send patients to and more than
275 half of the GPs already exchanged information with an osteopath about patients treated together.
276 Similar rates of treatment recommendations were also given in other publications [10–16]. A study
277 among GPs in London found that osteopathy was the most common referral among treatments
278 categorized as Complementary Alternative Medicine (CAM). 84% had received requests from patients
279 for a referral, and 78% had already suggested a referral for osteopathy [13]. Among British GPs, 9.1%
280 referred and 31% endorsed OMT within the last week [10]. In an Australian survey, 63% of GPs referred
281 patients to osteopaths and chiropractors at least a few times per year [16]. A further Australian study

282 from 2005 showed a lower recommendation rate for osteopathy of 23% within the last 12 months
283 [15]. Active physicians' recommendation for CAM plays a significant role in the patient's appropriate
284 use, perception and evaluation of the therapy [17, 18]; therefore, the GP has a significant influence on
285 the patient's decision making. When comparing our data with studies from other western countries, it
286 is important to note that the historical development of osteopathy has taken place at different speeds
287 and depths. Furthermore, the allocation of osteopathy to the respective national health system is
288 multifaceted.

289 Despite the regular and diverse points of contact, more than half of the physicians surveyed have little
290 or no knowledge about osteopathy itself. Personal narratives were cited by 69.5% as one source of
291 information, and more than one-quarter did not know which persons are legally justified to apply
292 osteopathic treatments. Those facts reveal a remarkable lack of information among German GPs.
293 Comparable percentages were given in the UK, with 60% of GPs defining themselves as having little
294 confidence in their osteopathic knowledge [10]. Other studies from the Australia and Canada showed
295 similar numbers [14, 19]. However, it seems that British GPs were significantly better informed about
296 official qualifications of osteopathic practitioners than hospital doctors, and 84% of these GPs at least
297 knew the main principles of osteopathy [13].

298 Diagnoses concerning the spine and other musculoskeletal locations made up more than 60% of the
299 free text diagnoses. In the expectations of benefit given by GPs, low back pain, cervical/neck
300 complaints and headache/migraine were named most frequently. This is in line with the comparatively
301 high amount of external evidence on osteopathic manipulative treatment for (lower) back pain [20–
302 23], as well as the most common specific complaints evaluated in Benelux Osteosurvey 2013 with
303 osteopathically self-evaluated treatment occasions. They were mostly focused on musculoskeletal and
304 spinal column-related conditions. For 81% of patients in the Swiss Osteosurvey 2018, musculoskeletal
305 pain mainly located in the cervical, lumbar and fascial area played a role in the decision towards OMT
306 [24]. Meta-analyses of a Spanish osteopathic patient profile showed lumbar and cervical diagnoses as
307 well as headaches as the main reasons for a consultation[25]. Infants' asymmetry played a minor role.

308 Some special groups of patients (e.g., children, pregnant women), which are often described in
309 effectiveness studies of OMT [26, 27] as well as clinical conditions (e.g., infant asymmetry or excessive
310 crying) are rather seldom present in German GP practices and mostly treated by specialists. This might
311 be a reason for the low numbers of recommendations for those patients in this study.

312 Women are more likely to be convinced about osteopathy across almost all items of the questionnaire
313 and give a better benefit rating. This is in line with the German government's health report on CAM
314 from 2002 which noted that women are more open to the use of unconventional treatment methods
315 in general [28]. Women use alternative treatment methods significantly more often than men [29, 30].
316 This finding is therefore not specific for our study and osteopathy but rather generally valid for women
317 and CAM.

318 If the physician knows an osteopath who is qualified and, at best, lives nearby, if the patients' feedback
319 is positive and if the GP has even been treated himself/herself, the recommendation rate of therapy
320 to patients is significantly higher. This association was also found in other studies [31–33] and is in line
321 with results from a study performed among Estonian GPs in 2007. GPs who have been treated
322 themselves and who have greater belief in the effectiveness and evidence base for osteopathy more
323 often refer to osteopaths [34]. In the UK study, the lowest 10% scores for estimated effectiveness of
324 osteopathy were given by GPs who were male, over 50 years old, and/or working in a single practice
325 [10]. In contrast, an Australian survey from 2013 showed significant associations for osteopathic
326 referral with knowledge about osteopathy, patient load per week, own experience with CAM, patients
327 asking and request for referral, positive feedback from patients and belief in the efficacy of osteopathy.
328 Demographic factors like age, gender, level of rurality and location of medical school were not
329 predictive for referral to osteopaths [19]. Contrary to our findings, there was no significant difference
330 found between female and male GPs referring chiropractic/osteopathic treatment in an US-American
331 study [11].

332

333 Our questionnaire contained five items on GPs' opinions and views towards osteopathy.
334 Approximately a balanced number of positive and negative opinions among GPs was observed
335 regarding establishing an independent osteopathic profession, an overall lack of sufficient evidence
336 for osteopathy and a demand to limit osteopathic treatment indications. Three-quarters favored
337 having costs covered by health insurances and supported more knowledge about osteopathy for GPs.
338 Thus, the topic seems to polarize. Critical opinions are partly in contrast to the widespread practical
339 use of osteopathy. The opinions in other western countries diverge widely. OMT was rated in
340 comparable international surveys as useful and effective among 34 to 50% of GPs [10, 16, 19]. In
341 contrary, 50% of Australian GPs assessed osteopathic education as not primarily evidence based [14].
342 Osteopathy as part of the health care system would be accepted by 45.2% of GPs in Estonia [34]. In
343 the UK, 52% of GPs indicated that the NHS should pay for this therapy [10]. Moreover, 91% of GPs
344 agreed all osteopathic practitioners should be formally qualified and licensed by law [13]. The
345 questions of evidence, political recognition and regulation of indications for OMT remain to be clarified
346 in Germany.

347

348 **Strengths and limitations**

349 Regarding the link between GPs and osteopaths, our cross-sectional study is to our knowledge the first
350 of its kind in Germany. The sample is balanced throughout the whole country with a reasonable sample
351 size, and the substantial response rate supports the explanatory power of our findings.

352 We cannot exclude or definitively determine the size of a selection bias due to interest in the topic and
353 a positive view towards CAM and osteopathy. Social desirability might also have influenced response
354 rates.

355 In the questionnaire, free text diagnoses and unspecific answers complicated a precise categorization
356 of some diagnoses.

357 To gauge general attitudes towards osteopathy, we used a set of five items rather than a single direct
358 question. We asked indirectly and included several dimensions of opinion. The proposed score is based
359 on self-designed items and has not been validated. A direct question like “How much do you
360 sympathize with osteopathy in general?” may have been helpful. Furthermore, we figured out the
361 problem of causal relationship and the complete exclusion of multicollinearity as difficult to solve. We
362 could not distinguish whether a GP was first self-treated and then recommended OMT to patients, or
363 vice versa.

364

365 **Conclusion and implications for practice**

366 Osteopathy is frequently recommended in general practices in Germany, more often among female
367 GPs and physicians having their own previous experience with osteopathy. Most frequent reasons for
368 a recommendation are disorders of the spinal column followed by other complaints of the
369 musculoskeletal system and headaches. This study can provide the basis and orientation for future
370 research on patients’ needs and efficacy of osteopathic treatment. Nevertheless, there is a lack of
371 information among German GPs. Targeted, concise information material or guidelines [1] about the
372 philosophy, treatment methods, risks, scientifically evidence base and the legal situation could support
373 GPs in their function as health-care adviser dealing with osteopathy and may lead to the safe and well-
374 informed use of this treatment for patients.

375

376 **List of abbreviations**

377 CAM – Complementary Alternative Medicine; CMD – Craniomandibular Dysfunction; COPD – Chronic
378 obstructive pulmonary disease; GP – General practitioner; OMT – Osteopathic Manipulative Treatment

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466 **Declarations**

467 **Acknowledgements**

468 The authors want to thank all participating GPs for taking the time to contribute to this study
469 despite their demanding work. In addition, we would like to express our sincere thanks for the
470 organizational, content-related and emotional support provided by the staff of the Department
471 of General Medicine, especially the other student assistants and the secretary's office
472 represented by Mrs. Britt Häusler and Mrs. Nicole Schäfer.

473

474 **Funding**

475 There was no external funding for this study.

476

477 **Availability of data and materials**

478 The datasets used and analyzed during the current study are available from the corresponding
479 author on reasonable request.

480

481 **Authors' contributions**

482 JK contributed to design of the study, data compilation and questionnaire development;
483 collected all data; performed data analysis and interpretation; and contributed to drafting the
484 manuscript. GLS contributed to the conception, idea and design of the study; design and
485 pretesting of the questionnaire; evaluation and presentation of the data; drafting of the
486 manuscript; and supported content development and organization throughout the entire
487 project. TD contributed to creating and pre-testing the questionnaire; gave advice on statistical
488 analysis and interpretation of the data, descriptive illustration, logistic regression; and helped
489 with drafting and formatting the manuscript. AKG and MB contributed content-related advice
490 on the logic and context of the manuscript. SU contributed to statistical analysis and
491 interpretation of data, especially logistic regression. TF initiated the study with the idea for the
492 research topic, provided content-related input, and reviewed and revised the manuscript.

493 All authors read and approved the final manuscript.

494 **Corresponding authors**

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497 **Ethics approval and consent to participate**

498 According to the Model Professional Code for Physicians [35], an explicit ethics approval was
499 deemed unnecessary for this study because the questionnaires were anonymous and no
500 personal identifiable data was collected. The participating GPs were informed by a written
501 formal cover letter about the use and publication of their anonymized data for this study.
502 Participation in the study was completely voluntary. Returning the completed questionnaire
503 was interpreted as informed consent to participate in the study.

504 The Ethics Committee at the Medical Faculty of the University of Leipzig confirmed in their
505 “waiver” on 21st of April 2021 that there is no professional legal and ethical consulting obligation
506 for this project through the anonymization of the questionnaire participants.

507 All procedures performed in studies involving human participants were in accordance with the
508 ethical standards of the institutional and / or national research committee and with the 1964
509 Helsinki declaration and its later amendments or comparable ethical standards.

510

511 **Consent of publication**

512 Not applicable, as the manuscript does not contain data from any individual person.

513

514 **Competing interests**

515 The authors declare that they have no competing interests.

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Figures

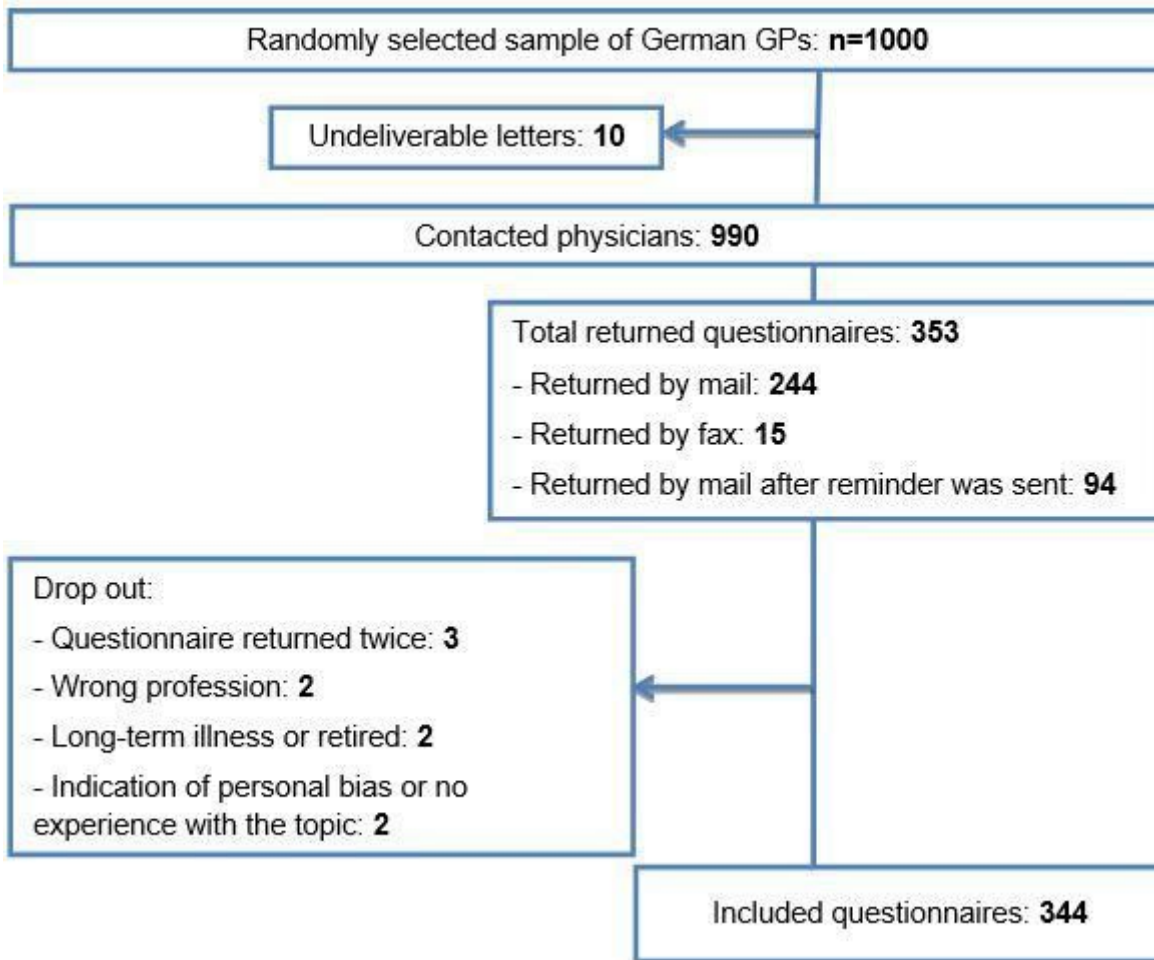


Figure 1

Sampling flow chart

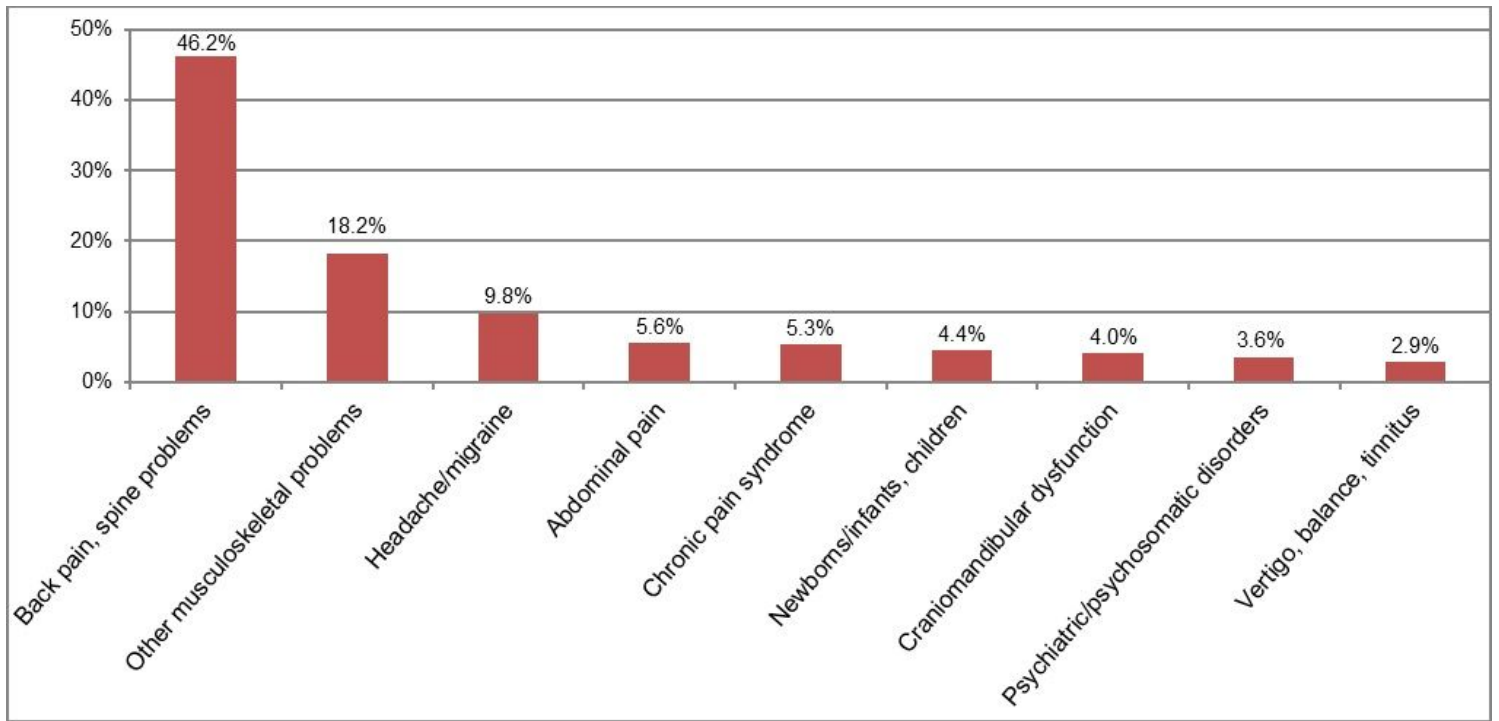


Figure 2

Open text reasons for encounter of most likely recommended clinical pictures for osteopathic treatment in % (n=450)

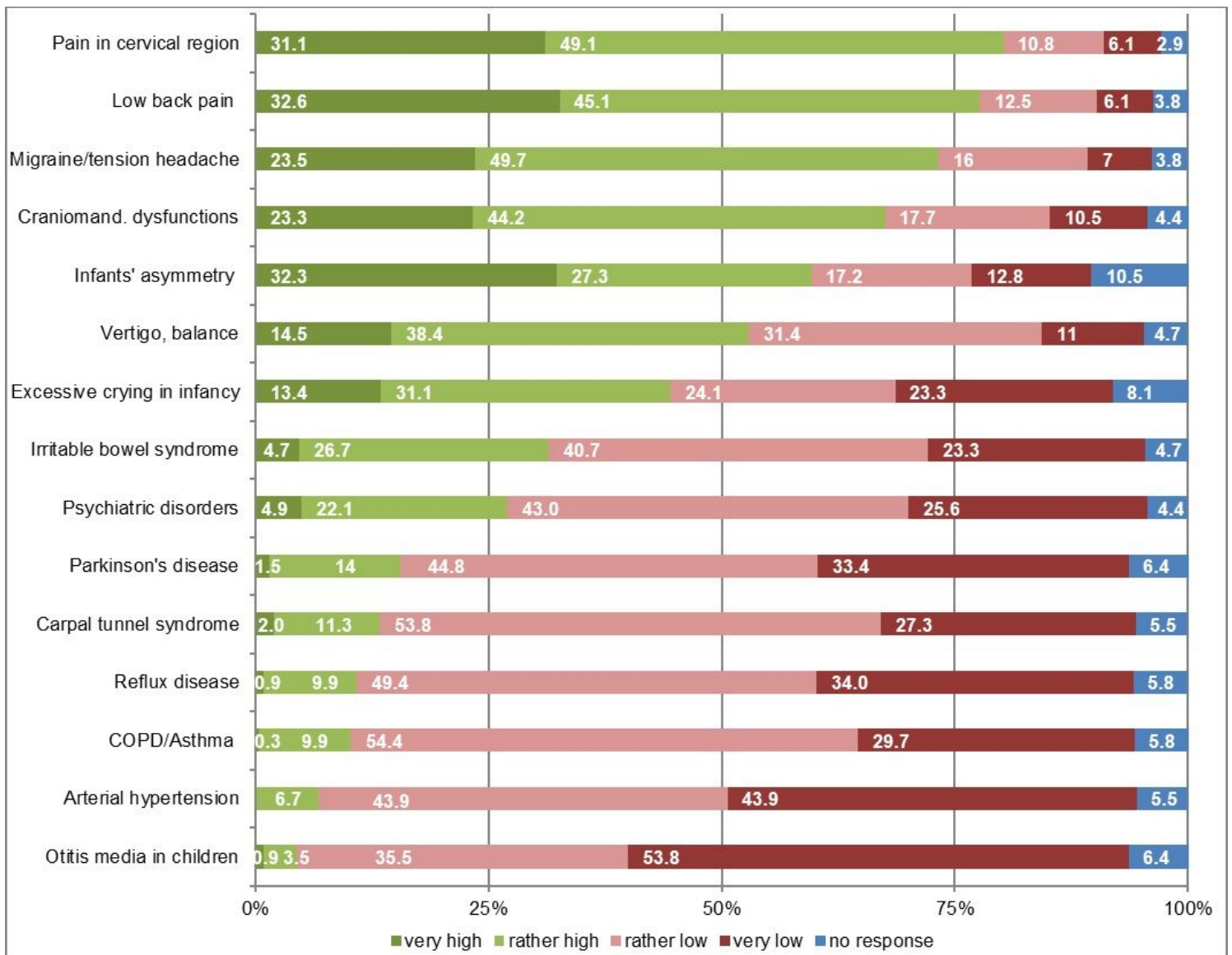


Figure 3

Expectations of benefit from osteopathic treatment for different pre-selected reasons for encounter via GPs self-assessment in % (n=344)

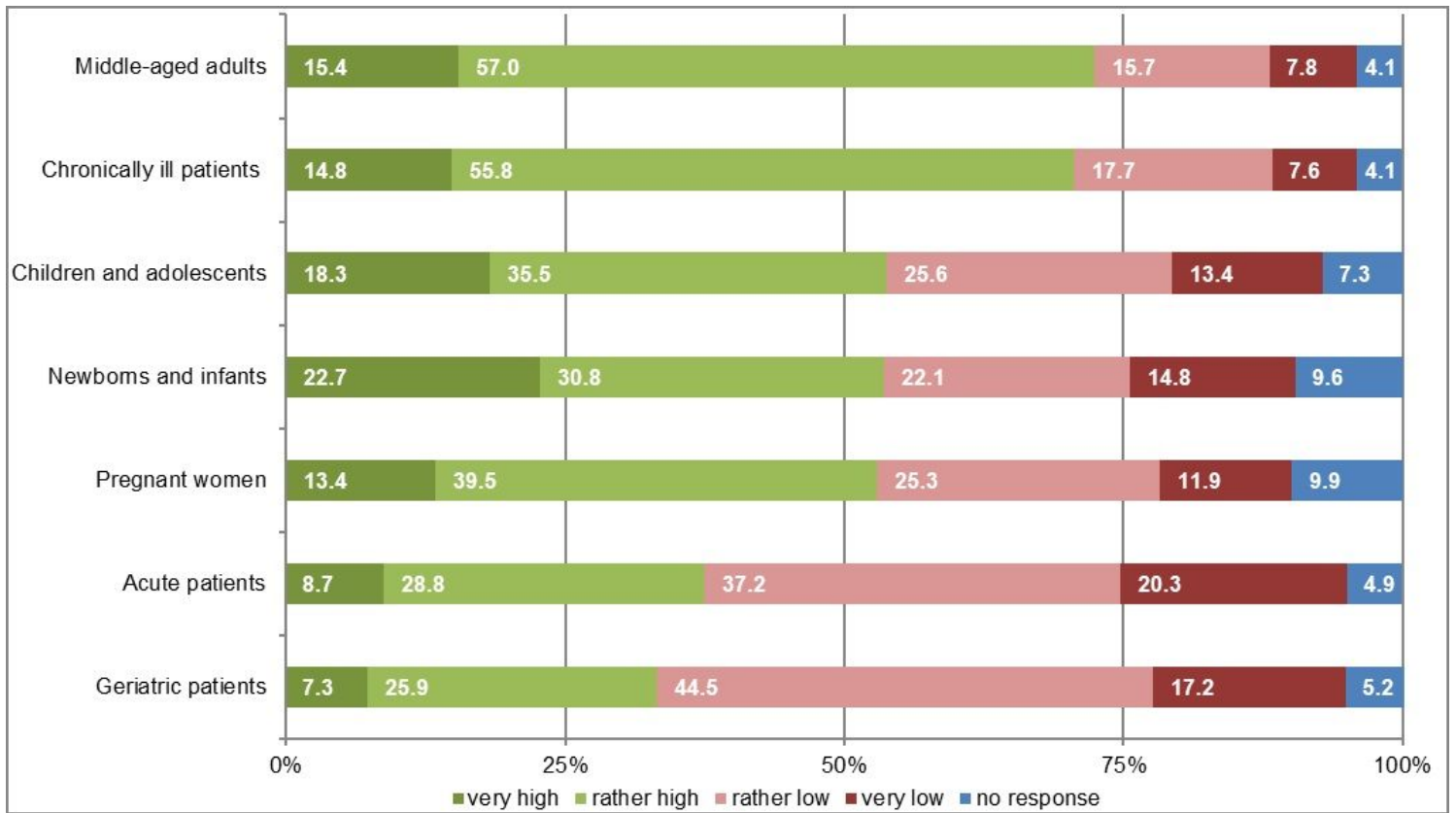


Figure 4

Expectations of benefit from osteopathic treatment for different patient groups via GPs self-assessment in % (n=344)

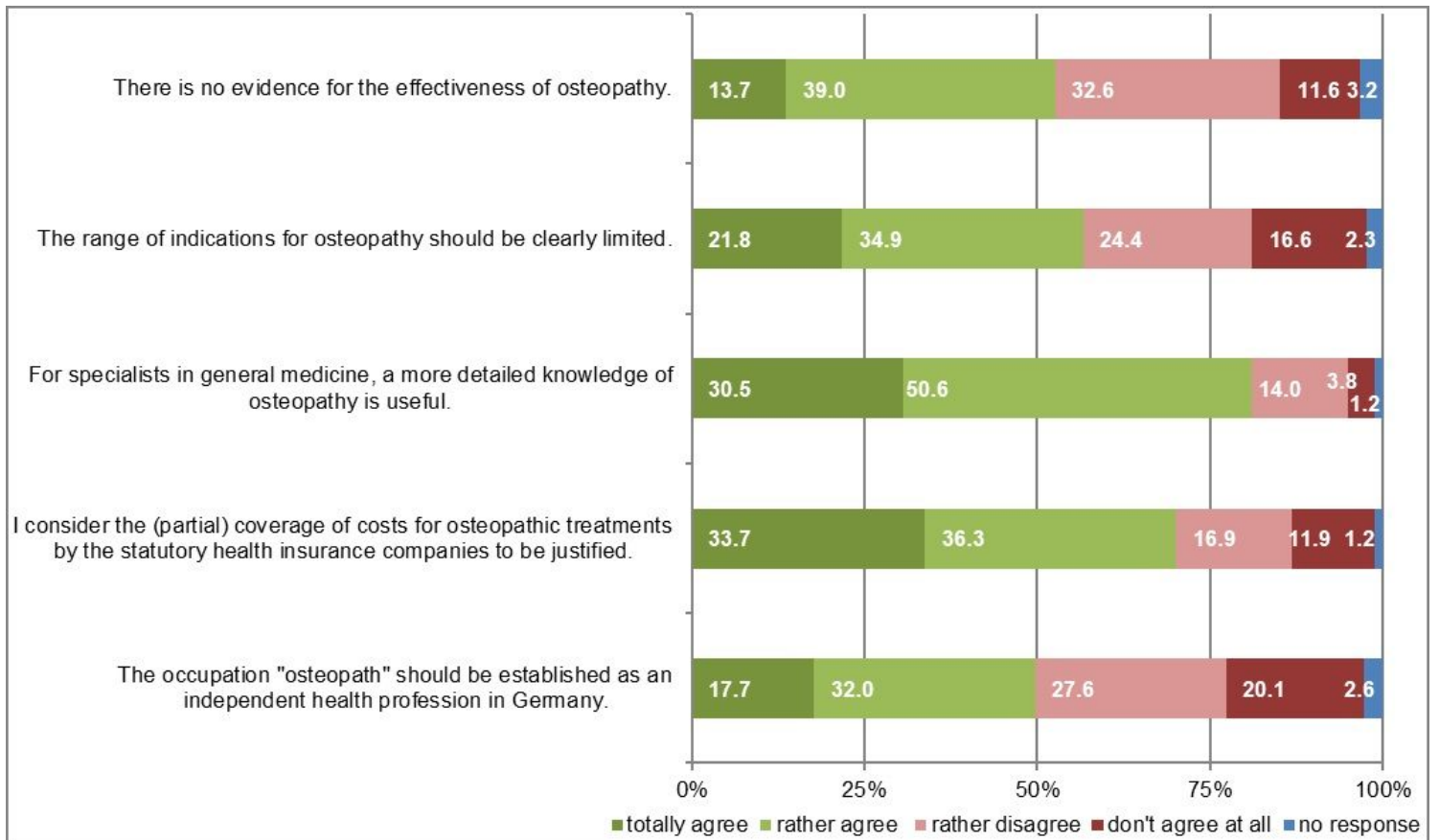


Figure 5

"How do you agree with the following statements?" answers in % from all GPs (n=344)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementarymaterialOsteopathyinGermanyJK.pdf](#)