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The status quo of research data management in the German-speaking sports sciences—Results of an online pilot survey

Introduction

In October 2022, the German Society of Sport Science (dvs) set up an ad hoc committee “Research Data Management” (RDM) with the aim, among others, to develop RDM guidelines for the German sports science community¹. Setting up this committee came at a time when FAIR and open research data management practices (see Wilkinson et al., 2016; Murray-Rust, 2008 for definitions, respectively) became increasingly acknowledged by the (sports) science communities (e.g. Caldwell et al., 2020), and was accompanied by recent developments within the German sports science community, e.g. the release of the sports science research data repository MO|RE data² (Klemm et al., 2024a), highlighting the potential of sustainable sports science RDM (Krüger, Binossek, Stocker, & Betz, 2023). Importantly, while an efficient and sustainable RDM does not mandate the specific practices of FAIR or Open Data, it facilitates their adoption. At the same time, researchers face an increasing demand by funding bodies and publishers to adhere to Open Science practices and to publish their research data.

In the last 15 years, international surveys investigated Open Science willingness and behavior in different scientific disciplines (Silverstein et al., 2024; Tenopir et al., 2020; Wallis, Rolando, & Borgman, 2013; Whitlock, 2011). They all reported researchers’ willingness of sharing own research data, while at the same time, data sharing is not equally practiced for various reasons, e.g., lack of knowledge or support, insecurity. In line with these findings, recent surveys on attitudes towards Open Science practices in the German sports science community suggest a general support for Open Science practices, but also restraints towards sharing research data, e.g. due to concerns about additional time needed to prepare research data to comply with different standards, ethical and legal questions, data sensitivity issues and questions about the scientific recognition for the efforts (Kloe, Niessner, Woll, & Bös, 2019; Wunsch, Pixa, & Utesch, 2023; Schönbrodt & Scheel, 2017). Guidelines formulated by a professional society might help to overcome potential restraints. They might provide an orientation for best practices in RDM within the community, as well as RDM standards already established within the own but also neighboring scientific communities.

To develop RDM guidelines, it is necessary to assess more than just attitudes towards data publishing. Rather, un-

derstanding the underpinning research practices is necessary to better understand possible barriers for the execution of sustainable and open research data practices. Thus, as an initial step, the dvs ad hoc committee conducted a pilot survey on the status quo of RDM within the German-speaking sports science community. The aim of the paper is to descriptively report and comment on the outcomes of this pilot survey and to stimulate further discussions and actions in RDM practice and research in the field.

Survey description

The pilot survey was conducted as an online survey in the period from August 16th to September 30th, 2023. Calls for voluntary participation occurred via the SPORTWISS mailing list (Ruhr University Bochum) on August 16th and September 6th, as well as during the “dvs Hochschultag” in Bochum, September 20th–22nd, 2023. In addition, survey participants, members of the ad hoc committee, and members of the mailing list were asked to further distribute the survey through their personal networks to extend its reach. The online questionnaire, provided exclusively in German, was generated and made available using SoSci Survey (Leiner, 2024).

At the beginning of the survey, participants received information about its

¹ <https://www.sportwissenschaft.de/die-dvs/struktur-und-gremien/ad-hoc-ausschuesse/>.

² <https://www.motor-research-data.de/>.

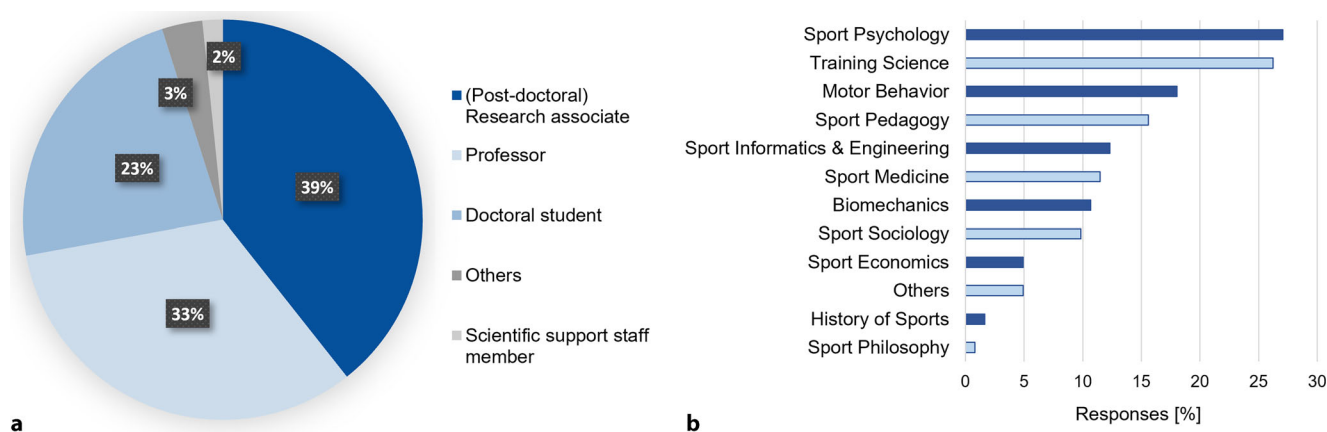


Fig. 1 ▲ Survey population ($n = 122$). Relative numbers of the participating researchers, split with regard to **a** the different status groups, as well as **b** section affiliations as existent within the German Society of Sport Science (dvs)

purpose and the confidentiality statement regarding data processing. The survey was structured into three parts and consisted of 12 to 25 questions, depending on the responses provided, including self-generated questions targeting the characteristics of the survey participants (first part), as well as questions adapted from Taubitz, Bobrov, and de Schellenberger (2022) and the GESIS Leibniz Institut für Sozialwissenschaften e.V. (n.d.). These questionnaires were identified through an unstructured search, reflecting the exploratory nature of our study and its aim to capture potential variety in RDM practices within the German sports science community. The GESIS survey (n.d.) provided a social science perspective, while the items from Taubitz et al. (2022) contributed a health science framework, aligning with the interdisciplinary character of the field. The second part addressed questions about participants' current RDM practices, while the third part focused on participants' general knowledge about RDM, including questions about which guidelines, regulations, or recommendations respondents are aware of, their level of familiarity with data protection and other relevant regulations concerning their data, and their knowledge about data management plans.

After completion of data collection, the response data along with the codebook were exported from the SoSci Survey platform for further processing and analysis in Excel (Office 16, Microsoft). The data quality was in-

dependently checked by two raters in accordance with the dual control principle. This included entries in the open text fields. Differences in the interpretation and following assignment of these entries were solved through joint discussion until mutual agreement. Only participants, who completed the questionnaire, i.e. who reached the final page, were included in the descriptive data analysis. For each question, absolute and relative number of responses were calculated. Absolute response numbers may vary between questions as participants were free to skip questions. In addition, participants were not presented to all questions, given their answer in a previous question, e.g. participants were not presented to follow-up questions on RDM practices in cooperative research projects if they indicated that they do not record data in cooperation with others. In the following, the most relevant outcomes of the pilot survey with regard to the status quo of RDM practices within the German-speaking sports science community are reported, while the complete questionnaire as well as the anonymized dataset is publicly available (Klemm et al. 2024b).

Survey population

The sample comprised of 126 completed surveys. Four participants declined consent to data processing and were, thus, excluded from further analyses. Consequently, the final sample consisted of 122 surveys, with participants taking an aver-

age of 5.6 (SD: ± 1.3) minutes to complete the survey (excluding breaks³).

The ad hoc sample included 28 doctoral students (23.0%), 48 (post-doctoral) research associates (39.3%), 40 professors (32.8%), two scientific support employees (1.6%), as well as four individuals in other roles (3.3%), see Fig. 1a. Further, members from all current dvs sections participated in the survey, though the degree of representation varied across the sections, see Fig. 1b. According to the current membership statistics of the dvs, the survey displays 11.2% of dvs members. The most represented sections are Sport Psychology (dvs: 12.6% vs. survey: 27.1%), Training Science (15.4% vs. 26.2%), Sport Pedagogy (26.2% vs. 15.6%), Motor Behavior (11.7% vs. 18.0%) and Sport Sociology (14.1% vs. 9.8%). However, these numbers should be treated with caution as the survey was not limited to dvs members, multiple responses were possible, and membership in a section is not compulsory or limited to only one in the dvs. Still, the participation of researchers from diverse status groups and subdisciplines points towards the fundamental relevance of the

³ Breaks were defined within SoSci Survey as remaining on a particular page for more than two hours or exceeding the sum of three times the interquartile range (IQR) and the median time for a particular page divided by 1.34 (which equals three standard deviations in a normally distributed sample), see <https://www.sosciurvey.de/help/doku.php/de:results:variables>.

topic for the German-speaking sports science community.

Research data management practices in data collection

In the following, outcomes of the survey will be jointly reported and discussed, starting with the step of data collection: First of all, it was inquired, which type of data participants work with, with multiple answers possible. More than half of the survey participants indicated working with data which is originally available in numerical form, i.e. survey data (68.9%), measurement data (61.5%), standardized test data (60.7%), or sensor data (50.8%). This suggests that quantitative research methods are prevalent in sports science. Other data formats were much less frequently indicated, e.g., audio/video/movie data (34.4%), observations (27.1%), or text data (21.3%), see [Fig. 2a](#). The results illustrate that researchers work with multiple data types in everyday research practice, similar to what was found by Taubitz et al. (2022) for health researchers, which has to be accounted for in the development of RDM guidelines.

Further, while 95.9% of the survey participants reported to collect primary data, a smaller but still substantial group (41.8%) reported to (also) reuse research data. This indicates that data reuse is already a research practice in the community, potentially driven by the increasing availability of open datasets and the recognition of the value of existing data sources. However, the extent to which reuse of research data serves the purpose of answering primary research questions, replicating findings, or providing background and context for collected research data cannot be inferred from the responses. In this context, the outcomes of a study by Wallis et al. (2013) on data sharing and reuse practices of scientists and technology researchers in the field of information science and sensor technologies indicated that the vast majority of data was reused for background and contextual reasons. Whether this also holds true for sports scientists is open for future investigations. Further research into this direction should also

explore the potential of data reuse for the generation of primary research questions and replication of findings in sports science research.

The survey also provided insights into data recording practices: Of the researchers, who indicated to collect primary data, 69.2% reported to collect data in cooperation with others. The majority of those have national university research partners (75.3%), followed by partners within the own university (70.4%), the own institute (59.3%), but also federations and clubs (50.6%), as well as international university research partners (50.6%) and a number of further cooperation partners mentioned less frequently (see [Fig. 2b](#)). Taken together, given the diversity of data collection practices within the German-speaking sport science community and the heterogeneity of the community itself, RDM guidelines should preferably build on best practices and RDM standards already established within its own as well as neighboring disciplines, rather than forcing the adoption of newly developed standards.

Management of research data access

Given the multiple types of research data and the relative frequency of research cooperation within the community, the question how legal and practical aspects of RDM are handled in everyday research practice gains importance. In this context, we asked survey participants about (a) who is recording the data, (b) who owns the rights to the data, (c) who has access to the data during and after study conduction and (d) where data is stored during and after study conduction. For each of the four questions, multiple responses were possible. An overview on the outcomes is presented in [Fig. 3a–d](#), respectively. The majority of the 117 participants who indicated to collect primary data, responded to record data themselves (82.1%), followed by research data being recorded by students (68.4%), (post-doctoral) research associates (56.4%), doctoral students (56.4%), and further persons mentioned less frequently (see [Fig. 3a](#)).

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Abstract

In October 2022, the German Society of Sport Science (dvs) set up an ad hoc committee “Research Data Management” (RDM) with the aim, among others, to develop research data management guidelines for the German sports science community. Recent surveys focusing on various other scientific disciplines suggests barriers for the implementation of sustainable and open RDM practices. Here, guidelines formulated by a professional society might help to overcome potential restraints. On this account, as a first step within the dvs ad hoc committee, a pilot survey was conducted in August to September 2023 to assess the status quo in RDM practices in the community. The online survey was structured into three parts: (1) characteristics of the survey participants, followed by questions about the participants’ (2) current RDM practices, and (3) general knowledge about RDM. The survey was completed by 122 sports scientists from all sections within the dvs. The outcomes provide some interesting first insights into the current RDM practices in data collection, the management of research data access, and the status quo in data publication of researchers in the community. This will guide actions within the dvs ad hoc committee, focusing on three core topics: guidelines, sensitive data, and best practices, but may also serve as a starting point for future research on facilitators and barriers for the implementation of sustainable and open research data practices.

Keywords

Survey · Research data management · Data publication · Open science · Best practices · Data protection and ownership

Regarding the question of data ownership, the survey provided a complex picture with the majority of the researchers, who record data in cooperation with others, responding to hold data rights themselves (77.8%). Interestingly, other

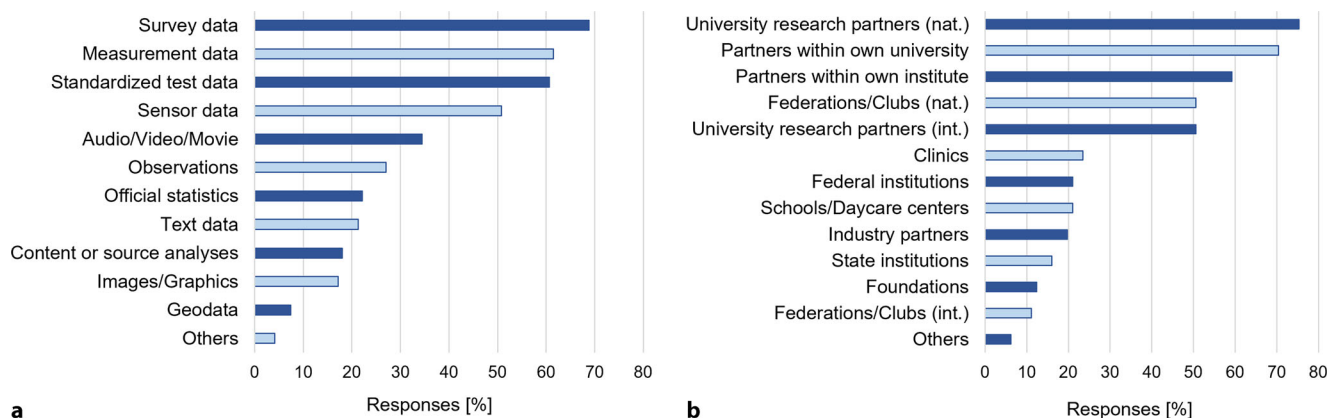


Fig. 2 ▲ Data recording practices in the German-speaking sports science community **a** Data types recorded by the survey participants ($n = 122$) **b** Cooperation partners during data recording ($n = 81$)

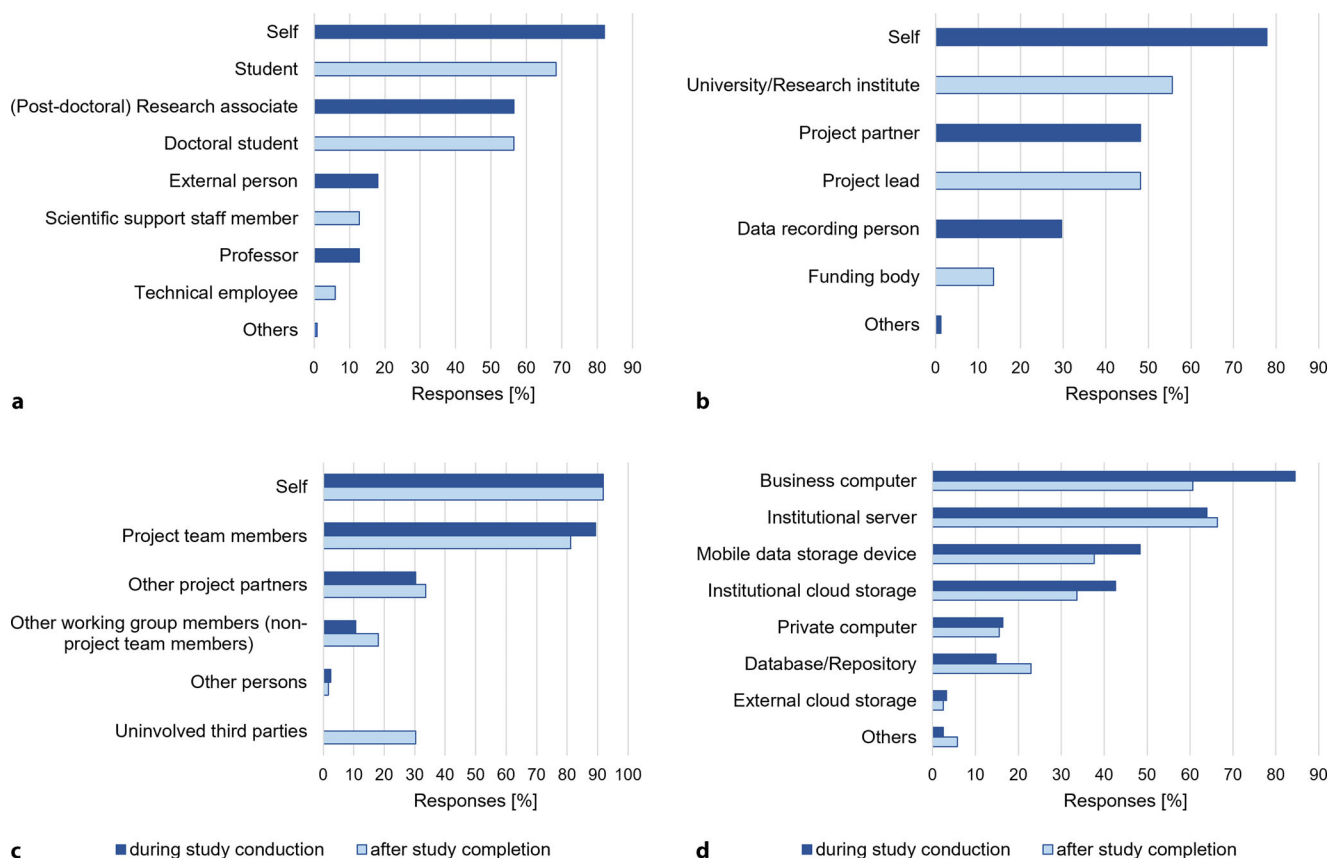


Fig. 3 ▲ Relative number for everyday RDM practices **a** Data recording persons ($n = 117$) **b** Indicated data ownership rights ($n = 81$) **c** Persons with data access during and after data recording ($n = 122$) **d** Data storage during and after data recording ($n = 122$)

persons and institutions were indicated as data owners as well (see [Fig. 3b](#)): with university/research institutes (55.6%), project partners (48.2%), and the project lead (48.2%) indicated by approximately half of the responding participants, each. On the other hand, (only) 29.6% of these participants assigned data ownership

rights to the person who recorded the data. The sum of these results points towards a mismatch in the relationship between data collection and data ownership. Lack of rights is also one of the main reasons given for not publishing data at all or having concerns about it (see Chap. 6, below, as well as Tenopir et al.,

2020; Wallis et al., 2013). Consequently, RDM guidelines should sensitize for the need to clarify data ownership in order to support an efficient and sustainable RDM.

The question regarding data access during and after study conduction provided a relatively clear outcome (see

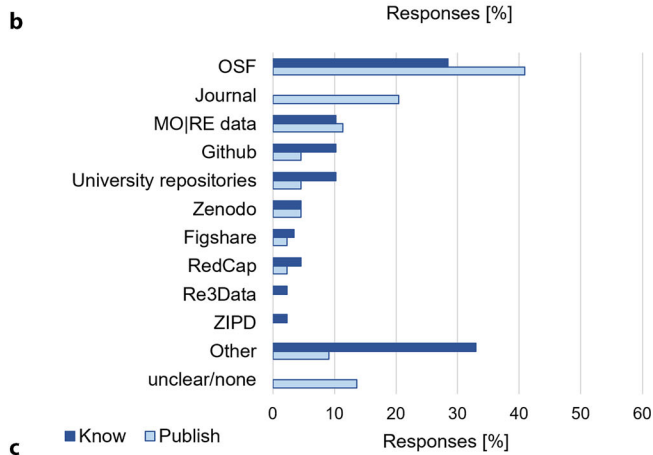
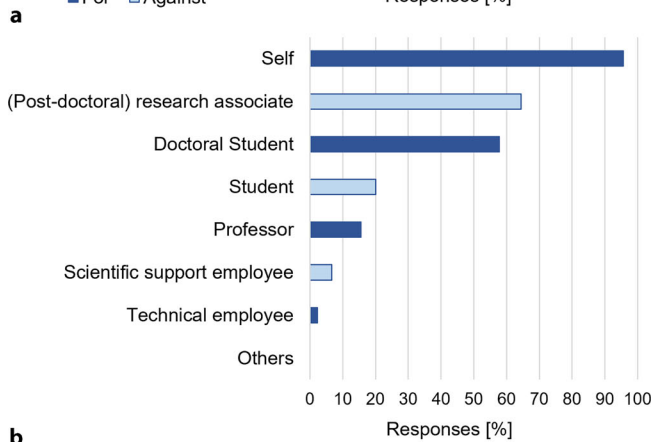
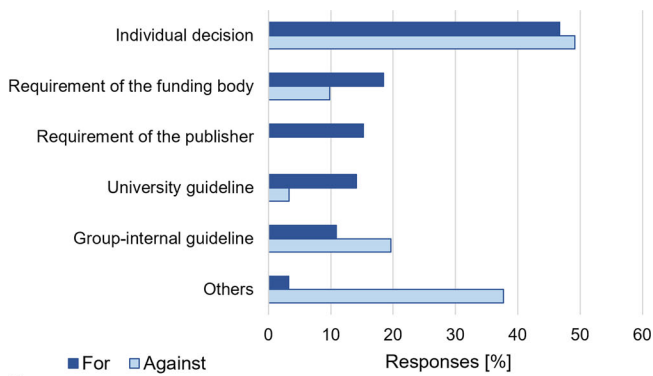


Fig. 4 ◀ Status quo in data publication. Relative number of responses for the different reasons **a** for ($n = 63$) or against ($n = 59$) data publication **b** Relative numbers of persons involved in the process of data curation for data publication ($n = 63$) **c** Research data platforms or repositories survey participants use or know ($n = 44$ and $n = 88$, respectively). Please note the different absolute numbers that the percentage refers to

Fig. 3c). Access to research data during and after study completion was predominantly granted to the researchers themselves (both 91.8%) and their project team members (89.3% and 81.2%, respectively). Data access during study completion is also granted to project partners as well as other working group members, who are not project team members (30.3% and 10.7%, respectively). Interestingly, these persons' access rights slightly increase after study completion (33.6% and 18.0%, respectively). Last, potentially reflecting evolving data publishing practices, 30.3% of the survey participants indicated to grant data ac-

cess to uninvolved third parties after study completion.

Regarding data storage practices, researchers seem to follow a multiple-storage strategy (see Fig. 3d) with a majority of survey participants indicating to store their data on a business computer and on institutional servers during study completion (84.4% and 63.9%, respectively) and after study completion (60.7% and 66.4%, respectively). While Tenopir et al. (2020) find similar results in their survey involving more than 2000 multinational and multidisciplinary researchers, they also emphasize that these most commonly used storage strategies

represent only short-term storage solutions, thus risky RDM practices. Here, again, RDM guidelines should suggest best practices for organizing data storage and access during and after study completion. These should account for the diverse requirements of the various data types that are prevalently collected in cooperation projects in the German-speaking sports science community.

Status quo in the publication of research data

The survey also assessed current practices in data publication, revealing that 52% of the survey participants publish their data. Interestingly, the main reason for and against data publication seems to be an individual decision (46.7% and 49.2%, respectively), with other, mainly external factors affecting decisions for data publication (see Fig. 4a). The reasons for not publishing research data are more diverse (see Fig. 4a), in line with findings by Tenopir et al. (2020). This highlights the importance of individual attitudes and perceptions in shaping data publication practices. Most of the researchers who responded to publish their data indicated themselves as the persons curating data for publication (95.5%), as well as (post-doctoral) research associates (64.4%) and doctoral students (57.8%). Other persons were indicated much less frequently (see Fig. 4b), with multiple responses possible.

When asked about where data is published, survey participants indicated to know or use 39 different platforms and repositories (see Fig. 4c), with OSF being the mostly known and used (28.4%, and 40.9%, respectively). Please note that the percentages refer to different absolute numbers of respondents. This finding is of interest, as it suggests a great variety of data repositories researchers in the German-speaking sports sciences are aware of. With regard to the development of RDM guidelines, it should be discussed whether to embrace this variety to account for the multiple data and project types, or whether to emphasize a smaller number of particularly suitable and well-established repositories to provide guidance.

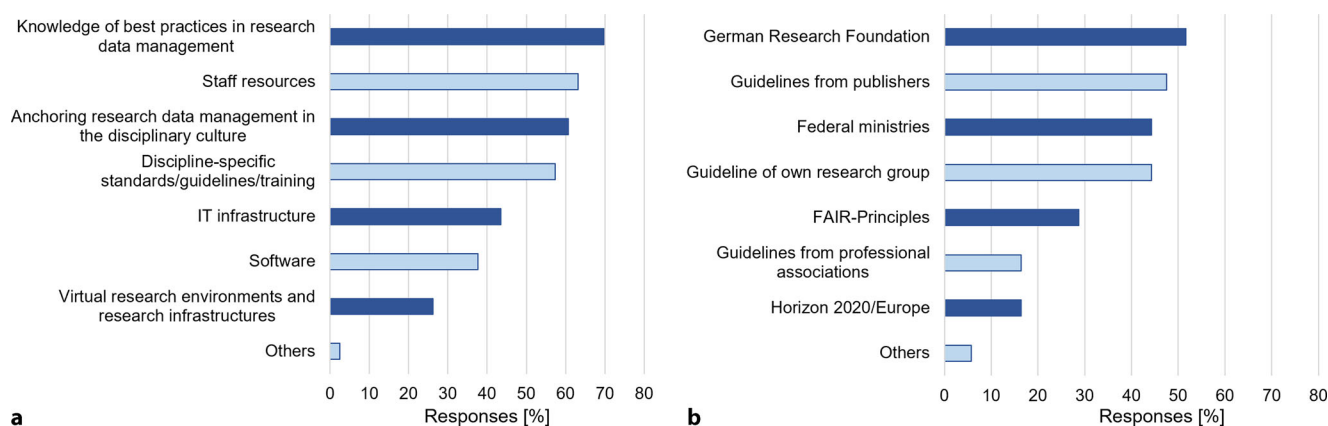


Fig. 5 ▲ Needs for actions. **a** Relative numbers of responses for wishes for improvements to support individual RDM practices ($n = 122$). **b** Knowledge about existing RDM guidelines ($n = 122$)

Need for future actions

In addition to the current practices and knowledge, the survey also shed light on the desires and needs of researchers in terms of improving RDM within the German-speaking sports science community (see [Fig. 5a](#)). A significant majority of the survey participants expressed a desire for more knowledge of best practices in RDM (69.7%). This suggests a strong interest in learning from successful examples and applying proven strategies to own research. It also underscores the need for more resources and training in this area.

The need for more staff resources was also highlighted by 63.1% of the survey participants. This could include additional personnel dedicated to RDM or more support for existing staff in handling data-related tasks. This finding points to the significant workload associated with RDM and the potential benefits of additional resources.

Survey participants also expressed a wish for anchoring RDM in the disciplinary culture of sports science (60.7%). This could involve integrating RDM practices into the norms and routines of the research community, making it a standard part of the research process rather than an additional task. This would require a cultural shift and ongoing efforts to promote and support such a change.

Last, 57.3% of the survey participants indicated a desire for discipline-specific standards, guidelines, and training. This suggests a need for more specific and

tailored guidance on RDM in the sports sciences, as well as opportunities to develop skills and competencies in this area. In this context, 51.6% of the survey participants reported being aware of the guidelines from the German Research Foundation, making it the most known set of guidelines in the survey. This was followed by guidelines from publishers (47.5%), federal ministries and the participants' own research group (both 44.3%), with multiple responses possible (see [Fig. 5b](#)).

The findings of this pilot survey highlight the importance of addressing both the practical and cultural aspects of RDM in the German sports science community. The results indicate that efforts to improve RDM should not only focus on providing resources and training but also on fostering a culture that values and supports effective data management.

Conclusion

With this pilot survey, we aimed at providing first descriptive data on the status quo of research data management practices within the German-speaking sports science community. The outcomes of this survey were planned to guide actions within the dvs ad hoc committee "Research Data Management", but might also stimulate future research actions. These might target a further internal differentiation of the sample with regard to sub-disciplines within the sports sciences, as well as with regard to different status groups and the context of data

reuse. This would require a larger, more comprehensive study population. Further, a longitudinal study on changes in RDM-practices, referring to the theory of planned behaviour (Ajzen, 1985), or the COM-B model of behaviour change (Michie, Van Stralen, & West, 2011, Silverstein et al., 2024) as theoretical framework, and assessing the perceived potential of data reuse for the generation of primary research questions in sports science research might be an interesting avenue for future research.

The outcomes of this pilot survey complement empirical evidence on RDM and data sharing practices, which revealed discipline specific differences between various science disciplines (Tenopir et al., 2020). In this context, discipline-specific RDM solutions for the sports sciences have to be developed. With the knowledge gained from this pilot survey, the dvs ad hoc committee "Research Data Management" has initiated working groups focusing on three core topics: guidelines, sensitive data, and best practices, which work towards creating the basis for a more robust and effective RDM culture within the field.

The "Guidelines" working group aims to publish recommendations to enhance knowledge and meet the community's desire for discipline-specific standards, focusing on adapting existing materials and standards from related science disciplines like psychology and social sciences, rather than creating entirely new RDM guidelines.

The “Sensitive Data” working group concentrates on data protection and ownership, supporting the “Guidelines” group by integrating existing knowledge and legal expertise to address identified knowledge gaps and provide detailed information for sports science use cases.

The working group “Best Practices” works on ways to publish and educate on best practices in RDM that are useful for as many researchers in the German sports science community as possible. The survey showed that there are huge differences in-between the researchers’ RDM knowledge, data handling and experience. Increasing knowledge about best practices can close this gap in a very practical way. Workshops, a brochure, or online tools are being considered as possible ways to reach the broad community.

The outcomes of these working groups are planned to be presented to the public at the next “dvs Hochschultag” in September 2025. We are excited about the potential impact of this work and committed to ensuring that it leads to tangible benefits for researchers in the German sports science community.

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Declarations

Conflict of interest. K. Keller, A. Pleger, C. Niessner, E. Ueding and M. Krüger declare that they have no competing interests.

For this article no studies with human participants or animals were performed by any of the authors. All studies mentioned were in accordance with the ethical standards indicated in each case. Participants were free to withdraw from the study at any time without any consequences for them.

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