

## Supplemental Digital Appendix 1

### Questionable Research Practices Survey

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Thank you for your interest in our survey!

We, Erik Driessen, Tony Artino, and Lauren Maggio, are inviting authors, such as yourself, who published HPE research in 2016 to participate in this health professions education (HPE) study. Please read the below information sheet carefully and feel free to contact us if you have additional questions by using the email addresses below.

#### **Study purpose:**

This study seeks to determine the prevalence of questionable research practices (QRPs) in HPE to inform educators, practitioners, and journal editors. In doing so, we hope the HPE community might be better positioned to take evidence-informed action, should the results indicate a need for such action. This research project includes this administration of an online survey and the aggregate analysis of collected survey data. We aim to publish our findings in a peer-reviewed journal.

#### **Expectations:**

If you agree to participate, we will ask you to complete an online survey. The survey can be completed on a computer or mobile device. We estimate the survey will take approximately 12 minutes. The survey, includes 43 Likert-type questions that ask you to indicate the prevalence of QRPs in your research. The survey also includes 24 additional items about publication pressure and basic demographic information (e.g., professional degrees earned, gender). No preparation is necessary for the survey.

#### **Risk:**

There is no direct advantage for you in participating in this study. However, we believe it might provide a better understanding of QRPs and thus may have advantages for the field of HPE research. It is up to you to decide whether or not to participate in the study. Participation is voluntary. If you do participate in the study, you can always change your mind and stop participating at any time during the study, without giving a reason. If you decide to stop the study, any data collected will be deleted and not used for this study. Whether you participate or not, there are no negative consequences for you. You will not be paid for your participation in this study. A potential disadvantage of participation is the time (approximately 15 minutes) it will take to complete the survey.

#### **Data storage:**

Data collection will begin upon clicking the below link to the survey. Each time you reach the end of a survey page and elect to continue, responses from that survey page will be submitted and stored. No personal identifiable information will be collected (i.e., we will not collect your name, email, or IP address). Data will be stored anonymously in Maastricht University's Qualtrics account and is not traceable to you. Also, your responses will be analyzed in combination with those of other respondents. Only Drs. Driessen, Artino and Maggio will have access to the anonymous data. All data will be reported in aggregate in any reports or publications.

If you participate in this study, you consent to the data being stored for 10 years after ending the study for further analysis within context of this project. You cannot participate in this study if you do not give permission for this data storage (by consenting below). After 10 years, the data will be destroyed.

This study has been approved by the Ethical Review Board Committee of the Netherlands Association for Medical Education (Dossier #937)

Please don't hesitate to contact us directly if you have any questions about the research or this survey or would like further information. We can be contacted at the following email addresses and phone numbers: Erik (e.driessen@maastrichtuniversity.nl; phone: 31(0)43-3885774)

We appreciate your time and expertise!  
Erik, Tony and Lauren

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If you consent to taking this study, please read and check yes below:

I have read the above information sheet for participants. I have had the opportunity to contact the investigators ask additional questions. My questions have been sufficiently answered. I have had enough time to decide whether to participate or not.

I know that participation is entirely voluntary. I am aware of my right to withdraw or end my participation from the study at any time. I do not need to justify that decision.

I know that certain people have access to my data. These people are listed in this information sheet. I am entitled to inquire and look into how my data are stored.

I consent to my data being used in the way and for the purpose stated in the information sheet. If for any reason my data would be used for research with another objective, I will be informed and again be asked to consent.

I consent to my data being stored for another 10 years after ending this study to permit further analysis within the context of this study.

I consent to participate in this study.

☐ Yes

☐ No

**Research Practices:** In your work as an HPE researcher, **how often have you engaged in any of the following behaviors**, even if it has been only on a single occasion? If applicable, please consider your experiences with both quantitative and qualitative research.

	Never	Once	Occasionally	Sometimes	Frequently	Almost always	Not applicable to my work
Conducted a human-subjects research study without ethics approval (i.e., without institutional review board [IRB] approval)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Circumvented one or more aspects of human-subjects ethics rules (i.e., IRB rules)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collected course or curriculum data under the guise of "program evaluation" without human-subjects ethics (IRB) approval with the ultimate intent of using the data for research purposes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inappropriately stored sensitive research data (e.g., data that contains personally identifiable information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inappropriately emailed sensitive research data (e.g., data that contains personally identifiable information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stopped collecting data earlier than planned because the results already reached statistical significance, without formal stopping rules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fabricated data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pressured a student or other subordinate to be a study participant in your research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used students or residents as research subjects without informing the overseeing dean, program director, or other pertinent official	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	Once	Occasionally	Sometimes	Frequently	Almost always	Not applicable to my work
Deleted data before performing data analysis without disclosure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ignored a colleague's use of flawed data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ignored a colleague's questionable interpretation of data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reported a downwardly rounded p-value (e.g., reporting that a p-value of .054 is less than .05)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Misrepresented a participant's words or writings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided whether to exclude non-outlier data after looking at the impact of doing so on the results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In a qualitative study, failed to report disconfirming examples or cases that weaken your conclusions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collected more data after seeing that the results were almost statistically significant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To confirm a hypothesis, selectively deleted or changed data after performing data analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reported an unexpected finding as having been hypothesized from the start	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Concealed results that contradicted your previous findings or convictions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	Once	Occasionally	Sometimes	Frequently	Almost always	Not applicable to my work
Claimed you used a particular qualitative research approach appropriately (e.g., grounded theory) when you knowingly did not	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Claimed you used a particular qualitative research technique appropriately (e.g., saturation, triangulation) when you knowingly did not	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spread study results over more papers than is appropriate (so-called "salami slicing")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deliberately failed to mention important limitations of a study in the published paper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deliberately failed to mention an organization that funded your research in the published paper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inappropriately modified the results of a study due to pressure from a research advisor or other collaborator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inappropriately modified the results of a study due to pressure from a funding agency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Failed to disclose relevant financial or intellectual conflicts of interest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used someone else's ideas without their permission or proper citation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used sections of text from another author's copyrighted material without permission or proper citation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used sections of text from your own publications without proper citation (so-called "self-plagiarism")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Never	Once	Occasionally	Sometimes	Frequently	Almost always	Not applicable to my work
Selectively cited certain papers just to please editors or reviewers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cited articles and or materials that you have not read	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selectively cited your own work just to improve your citation metrics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reused previously published data without disclosure (co-called "duplicate publication")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used confidential information obtained as a reviewer or editor for your own research or publications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Refused to share data with legitimate colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Added one or more authors to a paper who did not qualify for authorship (so-called "honorary authorship")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accepted authorship for which you did not qualify (so-called "honorary authorship")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demanded authorship for which you did not qualify (so-called "honorary authorship")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Omitted a contributor who deserved authorship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Submitted (or re-submitted) a manuscript or grant application without consent from one or more of the author	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Submitted the same manuscript to multiple journals at once (so-called "duplicate" or "double submission")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Publication Pressure:** These items address publication pressure. Please indicate the extent to which you agree or disagree with the following statements, as they relate to your particular HPE context.

	Completely disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Completely agree
Without publication pressure, my scientific output would be of higher quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My colleagues' assessments of me, based on my publications, are stressful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Publication pressure strains my relationships with fellow researchers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I suspect that publication pressure leads some colleagues (whether intentionally or not) to inappropriately manipulate their data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Publication pressure leads me to have serious doubts about the validity of HPE research results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my opinion, the pressure to publish scientific articles has become too high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My colleagues judge me mainly on the basis of my publications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I cannot share innovative research proposals with my colleagues for fear of those ideas being stolen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Publication pressure harms science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### **Demographics:**

What is your gender?

- ☐ Male
- ☐ Female
- 

What is your age? [Drop-down menu]

- 1 to 100
- 

In which country or region do you primarily work? [Drop-down menu]

▼ Africa ... Other

- Africa
  - Asia
  - Australia/New Zealand
  - Canada
  - Caribbean
  - Europe (not including the UK)
  - Middle East
  - South/Latin America
  - United Kingdom
  - United States
  - Other
- 

What is your current academic rank or position title? (Select one)

▼ Medical Student (1) ... Not Applicable (14)

- Medical Student
  - Resident
  - Graduate/PhD Student
  - Fellow
  - Postdoc
  - Instructor
  - Lecturer
  - Assistant Professor
  - Associate Professor
  - Professor
  - Professor Emeritus
  - Staff
  - Other
  - Not Applicable
-



Which degree(s) do you hold? (Check all that apply)

- ☐ Bachelor's degree (BS, BA, BSN, etc.)
  - ☐ Master's degree (MA, MS, MSW, MPH, MSN, etc.)
  - ☐ Professional medical degree (MD, DO)
  - ☐ Doctoral degree (PhD, EdD, DrPH, etc.)
  - ☐ Other professional degrees (JD, PA, DVM, etc.)
- 

For the highest degree you selected above, what is your primary area of study? (Select one)

- ☐ Basic Science
  - ☐ Clinical Science
  - ☐ Social Science/Education
  - ☐ Humanities
  - ☐ Other: \_\_\_\_\_
- 

What is your primary work role? (Select one)

- ☐ Clinician
  - ☐ Administrator or Program Director
  - ☐ Teacher (clinical or classroom setting)
  - ☐ Researcher
  - ☐ Other: \_\_\_\_\_
-

Which of the following best describes the context in which you work? (Check all that apply)

- ☐ Undergraduate Medical Education (UME)
- ☐ Graduate Medical Education (GME)
- ☐ Continuing Medical Education (CME)

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In a typical work week, approximately what percentage of your work time do you spend on health professions or medical education research activities, including writing up your research (please report your answer as a percentage)?

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How many years have you been involved in health professions or medical education (in any capacity)?

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How many years have you been involved in conducting research in health professions or medical education?

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In thinking about your primary research activities, how would you characterize your work (Select one)?

- ☐ I am a quantitative researcher
- ☐ I am a qualitative researcher
- ☐ I am a mixed-methods researcher

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In total, approximately how many peer-reviewed publications have you authored or co-authored?

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If you have any other comments related to questionable research practices in HPE, or comments about this questionnaire, please share those here:

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Note that by clicking the below "next" button you will submit your questionnaire responses and be unable to return to the questionnaire.

Next

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We thank you for your time spent taking this survey.  
Your response has been recorded.

Powered by Qualtrics

## Supplemental Digital Appendix 2

**List of all the journals searched to identify health professions education researchers, from an international study of misconduct and questionable research practices, 2017**

<i>Academic Medicine</i> <i>Advances in Health Sciences Education</i> <i>African Journal of Health Professions Education</i> <i>Annals of Academic Medicine of Singapore</i> <i>BMC Medical Education</i> <i>Clinical Teacher</i> <i>Education for Health</i> <i>Edumecentro</i> <i>International Journal of Medical Education</i> <i>Investigacion en Educacion Medica</i> <i>Journal of Continuing Education in the Health Professions</i> <i>Journal of Educational Evaluation for Health Professions</i> <i>Journal of Graduate Medical Education</i> <i>Korean Journal of Medical Education</i> <i>Medical Education</i> <i>Medical Education Online</i> <i>Medical Teacher</i> <i>Revista Brasileira de Education Medica</i> <i>Revista de la Fundacion Educacion Medica</i> <i>Teaching and Learning in Medicine</i>
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\*Journals listed alphabetically.

**Breakdown of response rates for health professions education researchers from across the World Health Organization's six world regions (data based on curated sample), from an international study of misconduct and questionable research practices, 2017**

Region	No. of respondents	No. of respondents + non-respondents	*Approximate Response rate (%)
North America	172	827	20.8%
Europe	115	496	23.2%
Africa and Middle East	36	158	22.8%
Australia / New Zealand	40	146	27.4%
Asia	30	140	21.4%
South/Latin America and Caribbean	17	73	23.3%
Total	410	1840	22.3%

\*Note: the numbers and approximate response rates listed here are different from those reported in the text of the manuscript and Table 1 because these numbers (a) do not include emails that were returned as undeliverable, (b) do not include respondents who either reported their region as "other" or did not report a region, and (c) do not include respondents from the social media sample.