Leiden University Medical Center

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Evaluation of 61 Good Research Practices in The Netherlands Code of Conduct for Research Integrity

RATIONALE

- Research misconduct remains a significant challenge
- 2% to 3% of researchers admit misconduct
- 10% to 13% research practices are questionable
- 14% to 30% researchers observe misconduct among peers
- 29% to 40% of research practices are considered questionable by peers
- Promoting Good Research Practices (GRPs) is essential.
- In 2004, the **Netherlands Code of Conduct for Research Integrity** was established, the latest revision

AIM

To evaluate 61 practices of good research of the Dutch Code of Conduct for Scientific Integrity in terms of clarity, relevance, frequency and seriousness of non-compliance by PhD students at the start of their career.

STUDY DESIGN AND POPULATION

Cross-sectional study conducted among PhD students at the faculties of Natural Sciences and Medicine of Leiden University.

Recruitment

- Participants of a mandatory Scientific Integrity course
- Opt-in option for participation in the study
- Recruitment period of one year, aiming for a sample size of 300 respondents.

Questionnaire

- Completed two weeks before the course
- Included demographic information and self-written description of own research practices
- Each participant evaluated a subset of 30 GRPs

Outcomes

Clarity, **Relevance**, and **Frequency** on a 5-point Likert scale. The **seriousness of non-adherence** was categorized into ”Minor shortcoming,” “Questionable research practice,” and “Research misconduct,” 'Rather not say' available for all questions. Participants were asked to formulate their own GRPs before evaluating the 61 practices.

Data Analysis

Descriptive analysis of participant characteristics.
Stacked bar charts for main outcomes
Scatter-plots:

- Mean Clarity *versus* Relevance
- Mean Seriousness *versus* Frequency

Subgroup analysis by faculty

RESULTS

- 332 (73%) participants completed the questionnaire
- Overall, the GRPs are considered clear and relevant, with only 7% scoring >3 on the Likert Scales.
- Non-adherence to 11 GRPs was considered misconduct
- 3 out of 4 research practices addressing Research Misconduct were identified as such.

Self-reported GRPs

Most frequent themes:

1. Honesty
2. Transparency
3. Reproducibility

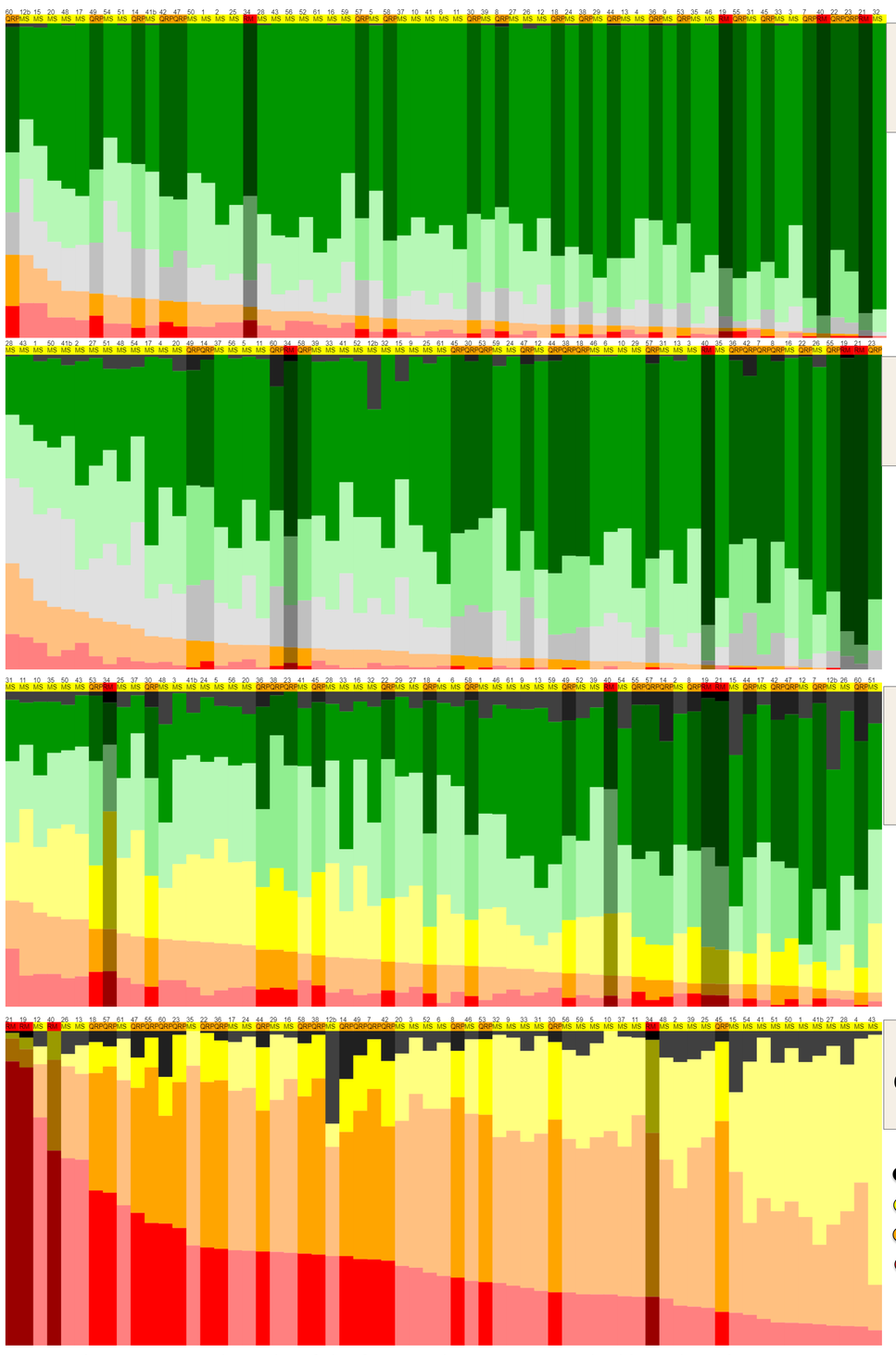
- No clear differences were identified between the faculties

KEY POINTS

- **Good Research Practices in the Netherlands Code of Conduct for Research Integrity are assessed as reasonably clear and relevant by PhD students.**
- **The majority of PhD students have experienced non-compliance to a specific research practice in their research group or department.**
- **Violations of 11 specific good research practices are considered Research Misconduct.**

Characteristics of participants

Variable		Everyone included
Age (years)	**Measurement**	
	Median [IQR]	27 [25 – 29]
	Missing	11% (n=37)
Survey time (minutes)	**Measurement**	
	Median [IQR]	33 [23 – 54]
	Missing	0% (n=0)
Education	**Group**	**% (n)**
	Full education in The Netherlands	52 (172)
	Full education in Europe	19 (62)
	Full education outside Europe	16 (54)
Type of work	**Group**	**% (n)**
	Laboratory	34 (114)
	Theoretical	13 (44)
	Clinical	11 (36)
	Computer modelling	10 (33)
	Multiple	24 (80)
Place of work	**Group**	**% (n)**
	Faculty of Medicine	35 (117)
	Faculty of Science	60 (200)
PhD experience	**Group**	**% (n)**
	0-12 months	48 (160)
	13-24 months	28 (94)
	25-36 months	13 (42)
Gender	**Group**	**% (n)**
	Male	46 (152)
	Female	53 (175)
Prior training	**Group**	**% (n)**
	Never	44 (145)
	2 hours or less	26 (85)
	Over 2 hours	29 (96)



Clarity

On a scale from 1 to 5; Do you think this research practice is clear and understandable?

- 0. Rather not say
- 1. Completely clear
- 2.
- 3.
- 4.
- 5. Not at all clear

Relevance

On a scale from 1 to 5; Do you think it belongs in a nationwide Code of Conduct for Research Integrity?

- 0. Rather not say
- 1. Completely relevant
- 2.
- 3.
- 4.
- 5. Not at all relevant

Frequency

On a scale from 1 to 5; Have you yourself experienced non-compliance to this specific research practice in your research group or department?

- 0. Rather not say
- 1. Never
- 2.
- 3.
- 4.
- 5. All the time

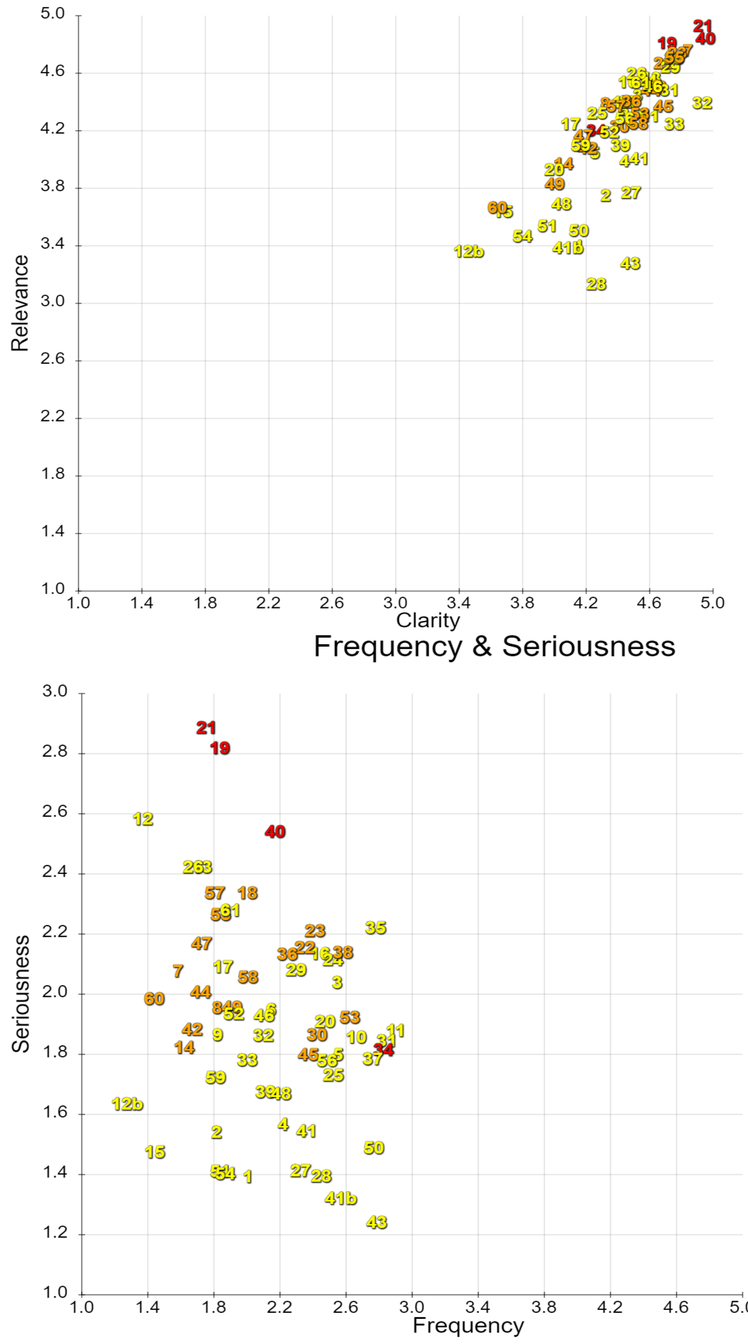
Seriousness of non-adherence

On a scale from 1 to 3; How would you categorize non-compliance with this practice?

- 0. Rather not say
- 1. Minor shortcoming
- 2. Questionable research practice
- 3. Research misconduct

For each question to the right of the figures, the GRPs are ranked based on the most negative responses from left to right. The order is different in each figure. The shade on the bars is to indicate how non-adherence was classified based on The Netherlands Code of Conduct:

1. Light: Minor Shortcoming
2. Normal: Questionable Research Practice
3. Dark: Research Misconduct



Scatter plots of the mean values of Likert scales of Clarity & Relevance and Frequency & Seriousness
The number relates to the listing in The Netherlands Code of Conduct For Research Integrity 2018. The color indicates the seriousness derived from the Code of Conduct:
Yellow: Minor Shortcoming (Least serious)
Orange: Questionable Research Practice
Red: Research Misconduct (Most serious)