


ETHICAL CONSIDERATIONS OF USING MACHINE LEARNING FOR DECISION SUPPORT IN OCCUPATIONAL PHYSICAL THERAPY: A NARRATIVE LITERATURE STUDY AND ETHICAL DELIBERATION.

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World Physiotherapy Congress Online 2021 9-11 April | Acknowledgements: This project was granted by Saxion University of Applied Sciences in the Netherlands and by Netherlands Organisation for Scientific Research NWO (023.011.076)

1. Introduction

Computer algorithms and Machine Learning (ML) will be integrated into clinical decision support within occupational health care. This will change the interaction between health care professionals and their clients, with unknown consequences.

2. Aim

To explore ethical considerations and potential consequences of using ML based decision support tools (ML-DSTs). We used an example in the context of occupational physical therapy.

3. Methods

Ethical deliberation supported by

- Narrative literature review
- Impact assessment of ML-DSTs according to frameworks from medical ethics and philosophy of technology.
- Reflection on biomedical ethical principles (Beauchamp and Childres, 2009) with a hypothetical clinical scenario from a Workers' Health Assessment.

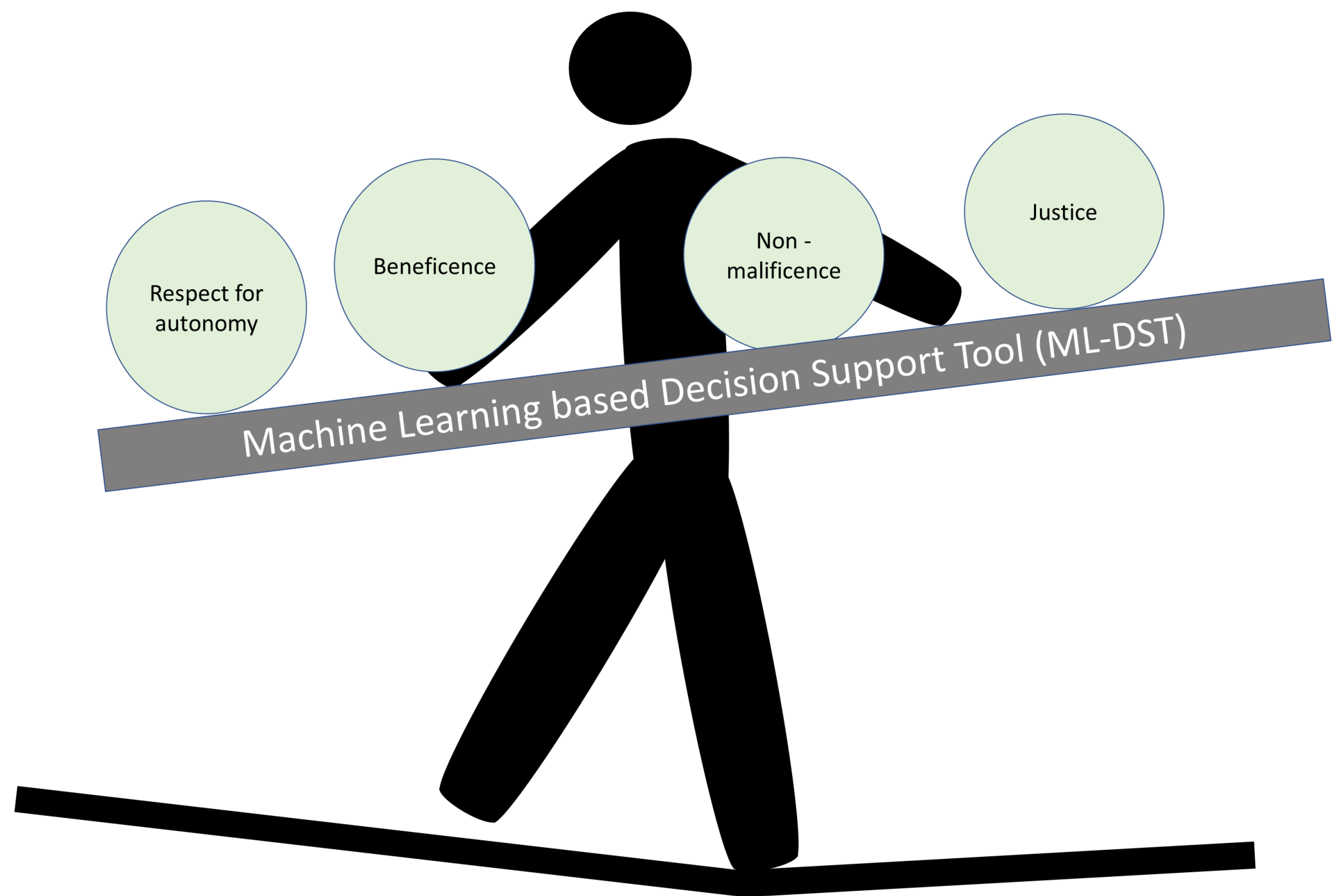
4. Results

Respect for autonomy	Beneficence	Non-maleficence	Justice
Uncertainty about what future consequences the worker is consenting to, due to the flexible nature of the ML-DST	The three elements of evidence-based practice are affected, which influences beneficent provision of advice: 1) evidence and data used by the ML-DST constantly changes and a critical stance towards validity is required. 2) the occupational health practitioner requires new clinical and epistemological expertise to apply recommendations from ML-DSTs. 3) the patient (worker)'s value towards the advice received depends on trust.	Balance between group level benefits and individual harm. Vulnerability of the worker in the occupational context. Blurred custodianship and ownership of data , combined with privacy issues require cautiousness regarding possibility of function creep*. *the gradual widening of the use of a technology or system beyond the purpose for which it was intended.	More objective and impartial advice empowers equal treatment when the ML-DST is valid. Potential risk of profiling and discrimination by excluding groups from tasks because of conflict of interest between employer's financial interest and worker's health interest.

5. Recommendations for socially responsible design

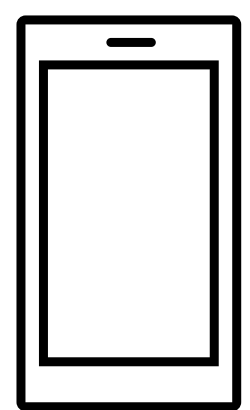
Recommendations to minimize undesirable adverse effects of the development and implementation of ML-DSTs:

- encourage multidisciplinary involvement in developing and training ML-DSTs for responsible and valid design with minimized risks;
- formal assessment by Health Research Ethical Committees for potential risks regarding privacy and custodian issues as well as discrimination and function creep;
- train physiotherapists in methods, validity and scope of ML-DSTs to support evidence-based practice.



6. Conclusion and Discussion

Questions arose that affect both client and professional values, leading to important ethical dilemmas for this area of practice. The deliberation process was transparent, but subjectivity could not be avoided because values are not consistent across all cultures and because we chose one framework for ethical principals.



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