Acceptance of Robots in Nursing Environment

Proposed Design of Questionnaire for Nurses

Prof. Dr. Martine Herpers, University of Applied Sciences Fulda
martine.herpers@informatik.hs-fulda.de

Research questions:
What is the variety of robots used in nursing environment?
How can the acceptance of robots by nurses be measured?

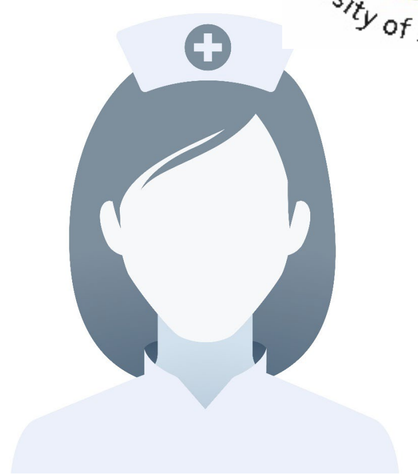


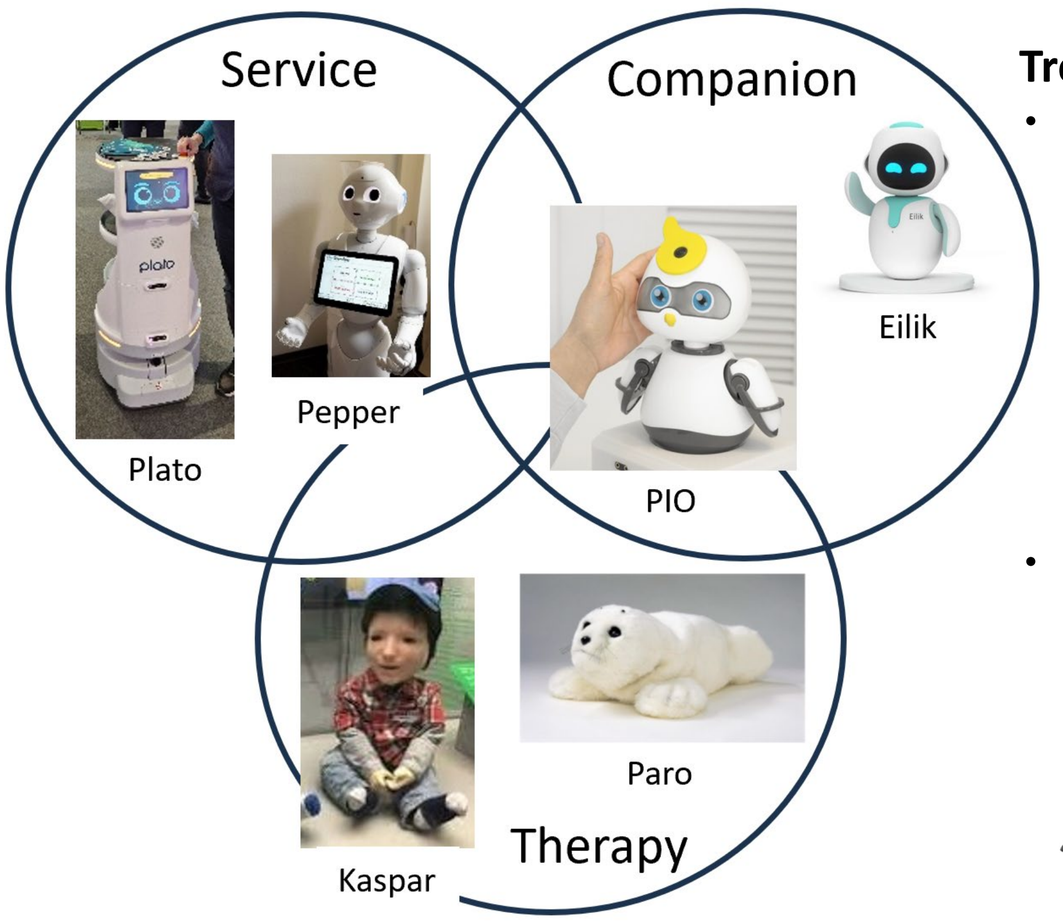
Image by DrawingMyDiary on Freepik

Design of Questionnaire

The variety in the robot systems makes it difficult to ask about acceptance. Most acceptance studies relate to a specific type of robot system and its use by the people being cared for. In order to relieve the burden on nursing staff, robot systems must be integrated into the **nursing processes**. This requires nursing staff to understand the functions and limits of their use. This is why the questionnaire is aimed at nursing staff.

Variety of Robots in Nursing Environment

Literature study e.g. [1], [2]



Trends in research

- Robot arms (humanoid)

GARMI, TUM

- Robotic wheel chair

Bangbang Robooter

Technology Acceptance

According to Almere Model [3] for Assistive Robots

Code	Construct	Question
		I agree that…
ANX	Anxiety	.. today's robots cannot hurt anyone
		.. robots cannot be damaged by me
ATT	Attitude towards technology	.. it makes sense to work with robots in care
FC	Facilitating conditions	.. I am sufficiently trained and prepared to handle the robots
		.. patients get along well with the robot
		.. defective robots are replaced or repaired by IT support
ITU	Intention to use	.. I can build an emotional relationship with the robot
		.. the robot does not create any additional work
		.. my positive attitude towards robots increases the success of robot application for those in need of care
PAD	Perceived adaptiveness	.. new versions of the robot should be similar to the old one in terms of usage
PENJ	Perceived Enjoyment	.. I enjoy working with the robot
PEOU	Perceived Ease of Use	.. the robot can be easily integrated into the care processes
		.. I can control the robot without having to turn away from the patient (e.g. with speech)
PS	Perceived Sociability	NONE
PU	Perceived Usefulness	.. there will be a lot of useful robotic assistance in the future
		.. the robot can relieve me of some of my workload
SI	Social Influence	.. my employer expects me to use or integrate robots
		.. using robots makes a good impression
		.. care robots improve teamwork
SP	Social Presence	.. robots should be able to respond to my emotions (e.g. anger)
Trust	Trust	... robots handle the data they collect confidentially
		.. robots perform their tasks reliably
Use	Use	NONE

Where do you work?

- ❑ Hospital
- ❑ Senior residence
- ❑ Outpatient care
- ❑ Intensive care (1:1)
- ❑ Day care
- ❑ in various facilities (e.g. as a leasing worker)

Spread of Robots in Nursing

Which robots did you use or worked with in professional health care?

- ❑ Cleaning robots (e.g. vacuum cleaners or mopping robots)
- ❑ Robots with displays (e.g. for explanatory videos)
- ❑ Robots for entertaining those in need of care (e.g. singing songs)
- ❑ Transport robots (e.g. for medication, files)
- ❑ Training robots for those in need of care (e.g. memory training)
- ❑ Therapy robots (e.g. for dementia, autism)
- ❑ Robotic devices (e.g. wheelchairs, arms)
- ❑ Other

Results: a large variety of robots are used in nursing environment: from humanoid robot until robotic devices. The questionnaire has to take the professional environment and the distance from nurses to robots into account. The Almere Model was used to complement questions using 5 point Likert scale for measuring the acceptance of the robots.

[1] [M. Früh and A. Grasser, "Erfahrungen aus dem Einsatz von Pflegerobotern für Menschen im Alter, in Pflegeroboter, Oliver Bendel Eds, Springer Gabler, 2018, pp.37-62
[2] D. Giansanti, "The Social Robot in Rehabilitation and Assistance: What Is the Future?", MDPI Healthcare 2021, 9, 244. https://doi.org/10.3390/healthcare9030244
[3] M. Heerink, B. Kröse, Vanessa Evers and Bob Wielinga, "Assessing Acceptance of Assistive Social Agent Technology by Older Adults: the Almere Model", in International Journal of Social Robots, pp. 361 – 375, 2010, DOI 10.1007/s12369-010-0068-5