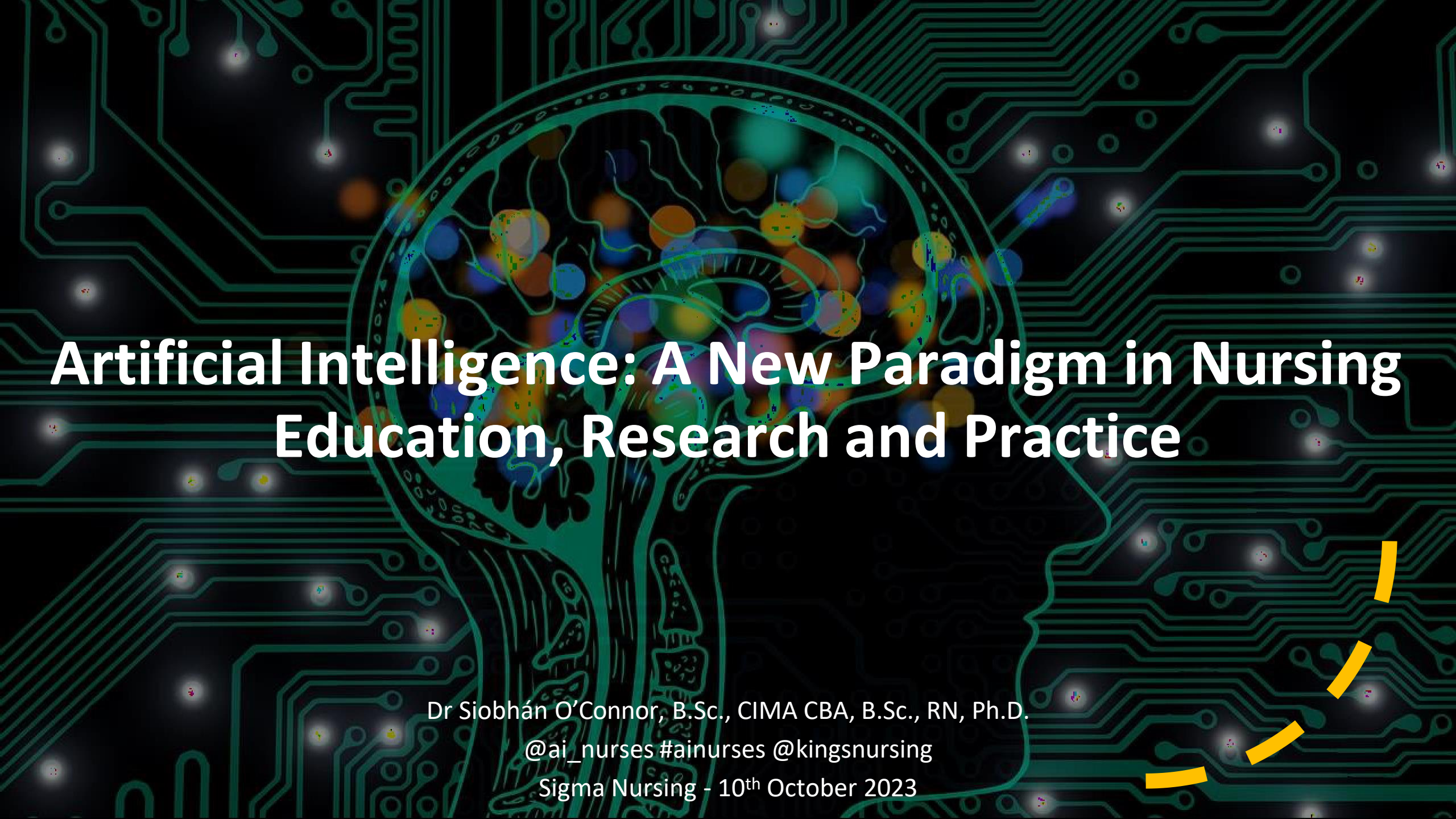

Artificial Intelligence: A New Paradigm in Nursing Education, Research and Practice

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@ai_nurses #ainurses @kingsnursing
Sigma Nursing - 10th October 2023

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https://www.kcl.ac.uk/people/siobhan-oconnor

*No conflicts of interest

AGENDA

- History of AI
- AI Domains
- AI in Nursing
- Nurses and AI

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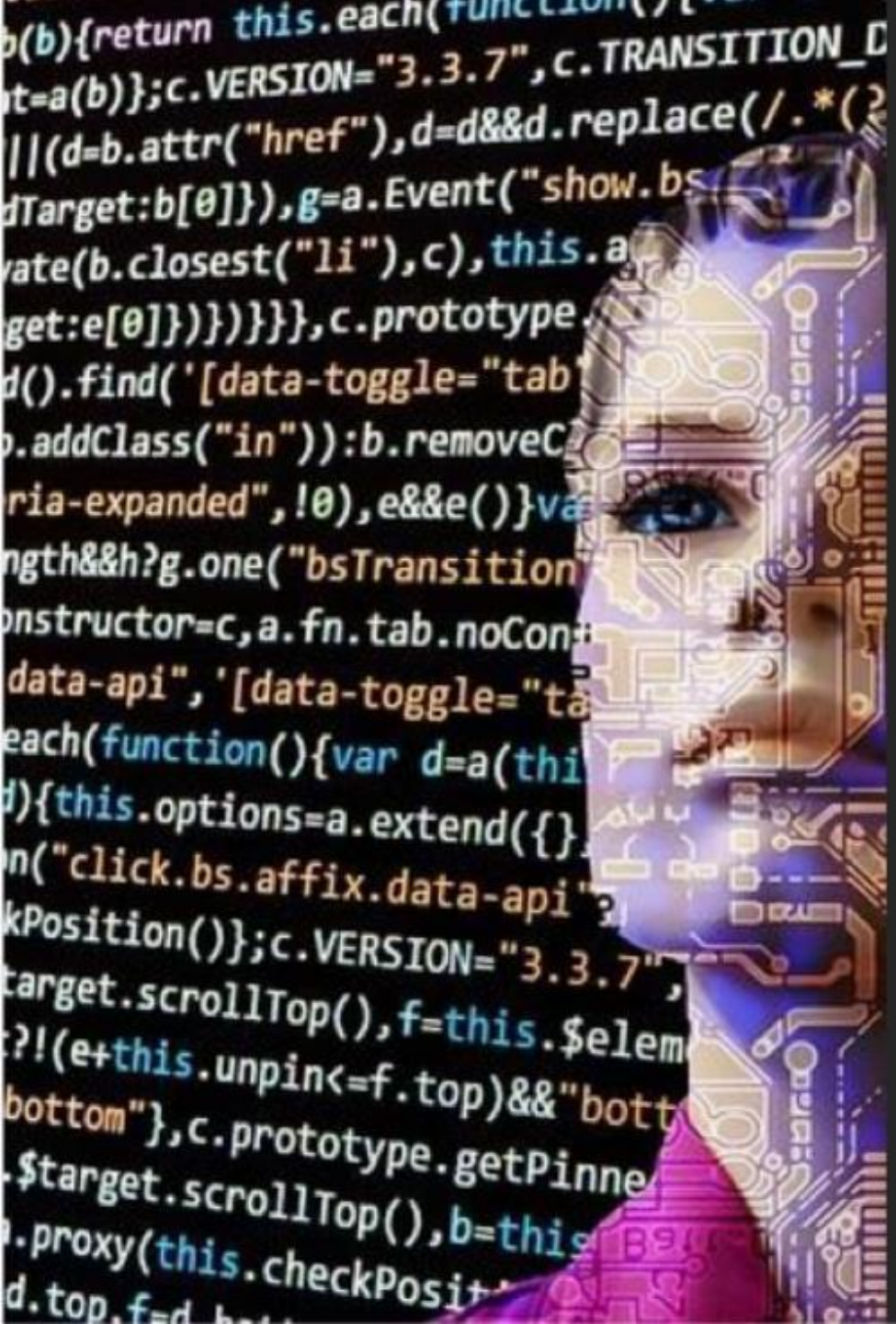
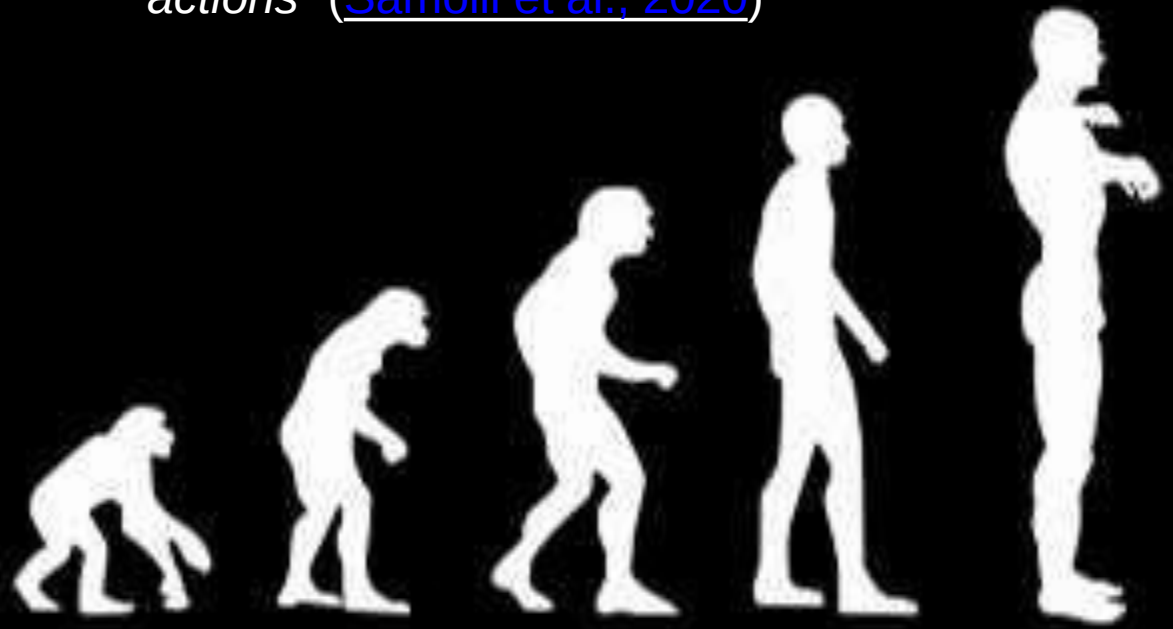


Background

- Artificial intelligence (AI) comprises of advanced computational techniques (algorithms)
- Aims to mimic human cognitive abilities
  - abstract reasoning
  - knowledge representation
  - learning
  - autonomous decision making
  - communicating in natural languages
  - sensing and interacting with the world

Artificial Intelligence (AI)

"software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous actions" (Samoili et al., 2020)



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Where AI began....

1950s - Marvin Minsky and John McCarthy

60's, 70's and 80's - lots of experimentation and dead ends

1990's - machine learning and natural language processing emerged

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International Journal of Nursing Terminologies and Classifications

Volume 4, Issue 1
January 1993
Pages 26-34

Free Access

Nursing Diagnosis by Computers: An Application of Neural Networks

Rose M. Harvey DNSc, RN

First published: January 1993 | https://doi.org/10.1111/j.1744-618X.1993.tb00080.x | Citations: 8

University of Manchester Library

PDF TOOLS SHARE

References Related Information

Abstract

In a pilot-test application of the neural network, test case diagnoses made by the ART-2 neural network agreed with those made independently by nurses. The main conclusion is that the ART-2 neural network is promising as a decision-making aid. It can handle probabilistic and ill-defined data through a process of pattern recognition without programming rules. A disadvantage is that the ART-2 neural network requires "training" by the nurse using at least one example to define a diagnosis. In practice, however, this requirement does not affect its usefulness. Moreover, providing the ART-2 neural network with several training examples enables it to identify new patterns that are "close"

Recommended

Factors Associated With Nursing Diagnosis Utilization in Canada

Kathryn A. Smith Higuchi PhD, RN, Corinne Dulberg PhD, Viola Duff MEd, RN

International Journal of Nursing Terminologies and Classifications

Nurse Practitioners' Use of Nursing Diagnosis

Kathleen Martin MSN, CRNP

International Journal of Nursing

Harvey (1993)

Domains within AI

- Machine learning algorithms
  - Supervised learning
  - Unsupervised learning
  - Reinforcement learning
- Natural language processing (NLP)
- Computer vision
- And more ……

- Supervised learning
- Unsupervised learning
- Reinforcement learning

Machine learning

(*more data, better model, higher accuracy*)

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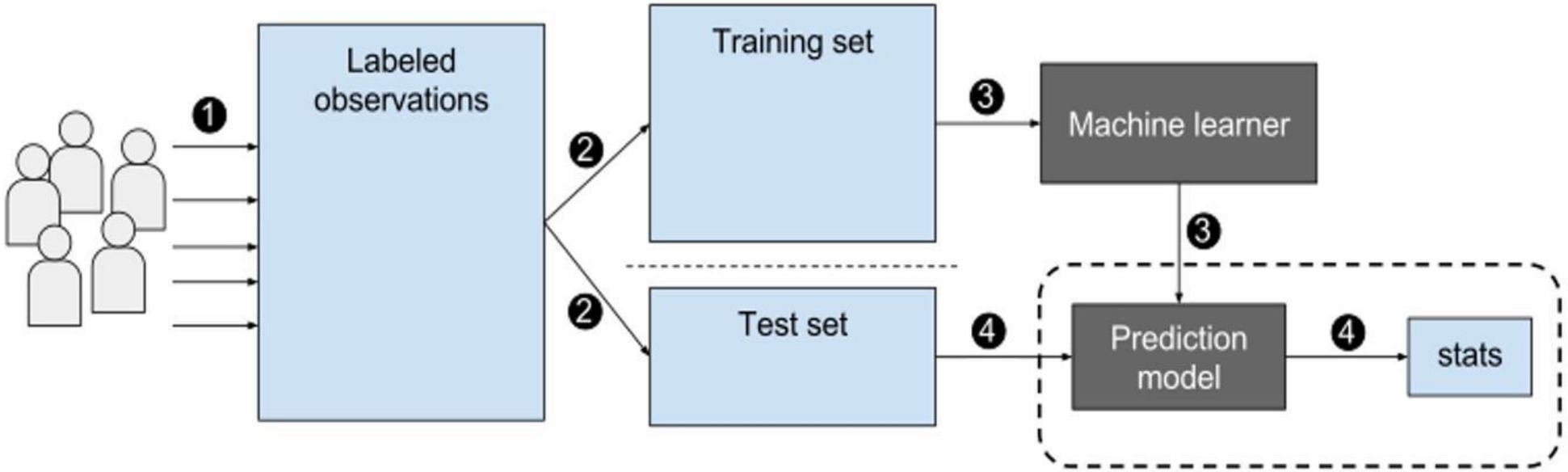
Supervised learning



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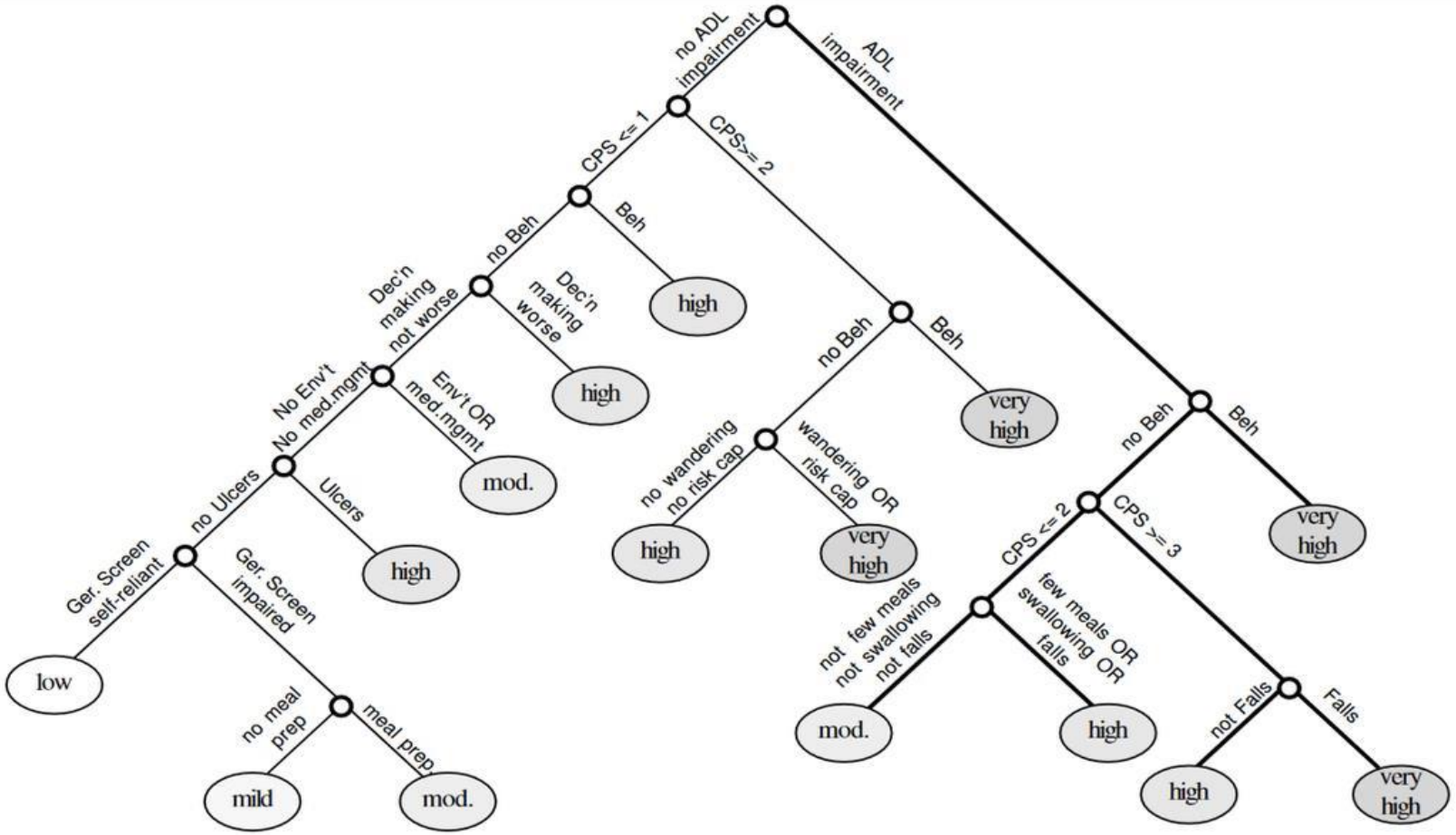

Figure 1
Schematic representation of the MAPLe algorithm.

Hirdes et al. (2008)

Decision Tree

(classification or regression tasks)

```
#write the decision tree model map to pdf file
graph[0].write_pdf("decisiontree.pdf")

#draw the decision tree model
Image(graph[0].create_png())
```

```
---------------------------------------------------------------------------
Exception                                 Traceback (most recent call last)
<ipython-input-12-fa85de214003> in <module>()
      1 #write the decision tree model map to pdf file
----> 2 graph[0].write_pdf("decisiontree.pdf")
      3
      4 #draw the decision tree model
      5 Image(graph[0].create_png())

c:\python27\lib\site-packages\pydot.pyc in <lambda>(path, f, prog)
   1683                 'write_'+frmt,
   1684                 lambda path, f=frmt, prog=self.prog:
-> 1685                     self.write(path, format=f, prog=prog))
   1686
   1687             f = self.__dict__['write_'+frmt]

c:\python27\lib\site-packages\pydot.pyc in write(self, path, prog, format)
   1766                 s = unicode(s)
   1767         else:
-> 1768             s = self.create(prog, format)
   1769             mode = 'wb'
   1770         with io.open(path, mode=mode) as f:

c:\python27\lib\site-packages\pydot.pyc in create(self, prog, format)
   1874                 raise Exception(
   1875                     '"{prog}" not found in path.'.format(
-> 1876                         prog=prog))
   1877             else:
   1878                 raise

Exception: "dot.exe" not found in path.
```

Algorithms written in Python or R

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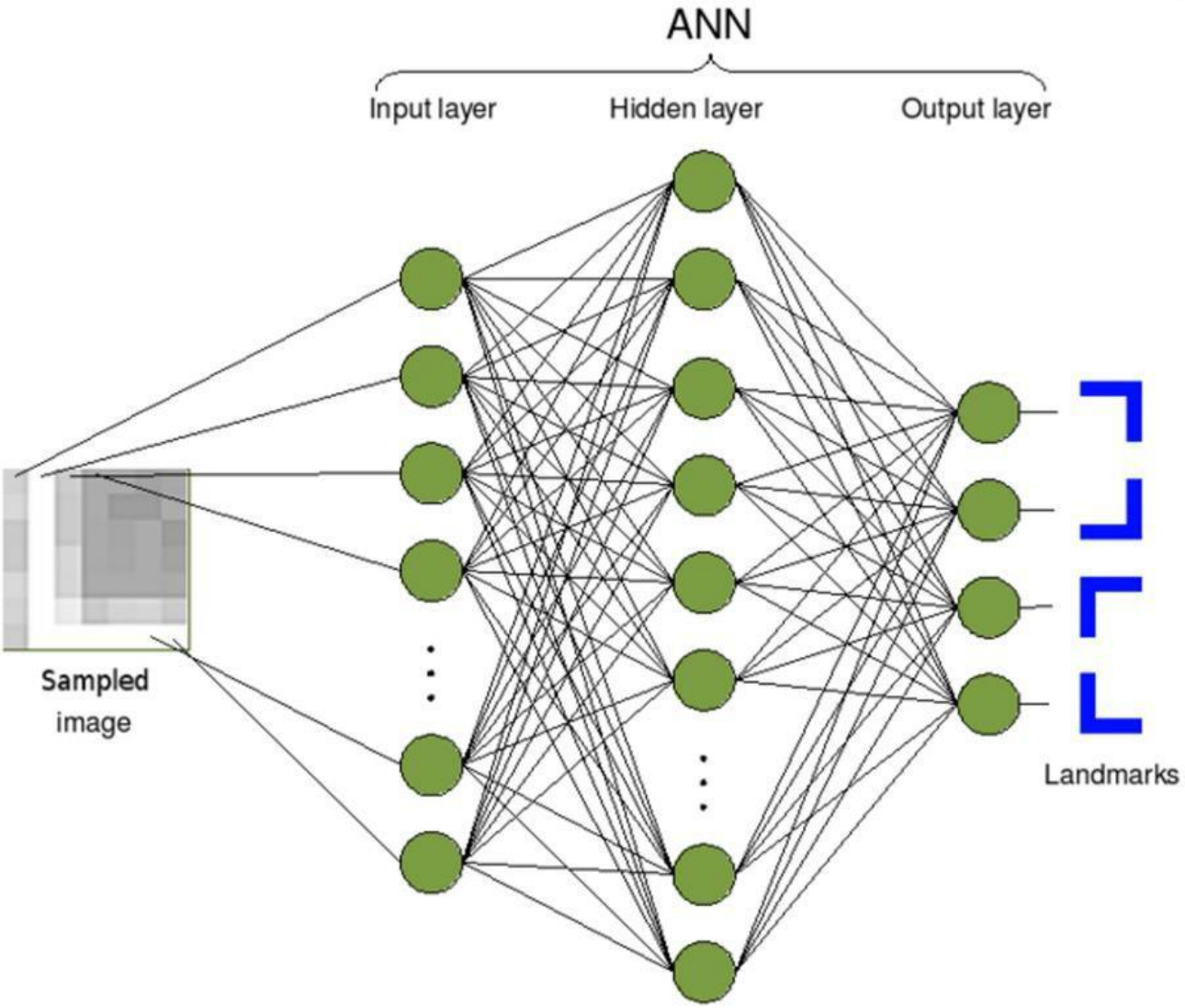

Artificial Neural Network

"deep learning"

"black box"

Different types of neural networks e.g., perceptrons, convolutional, recurrent

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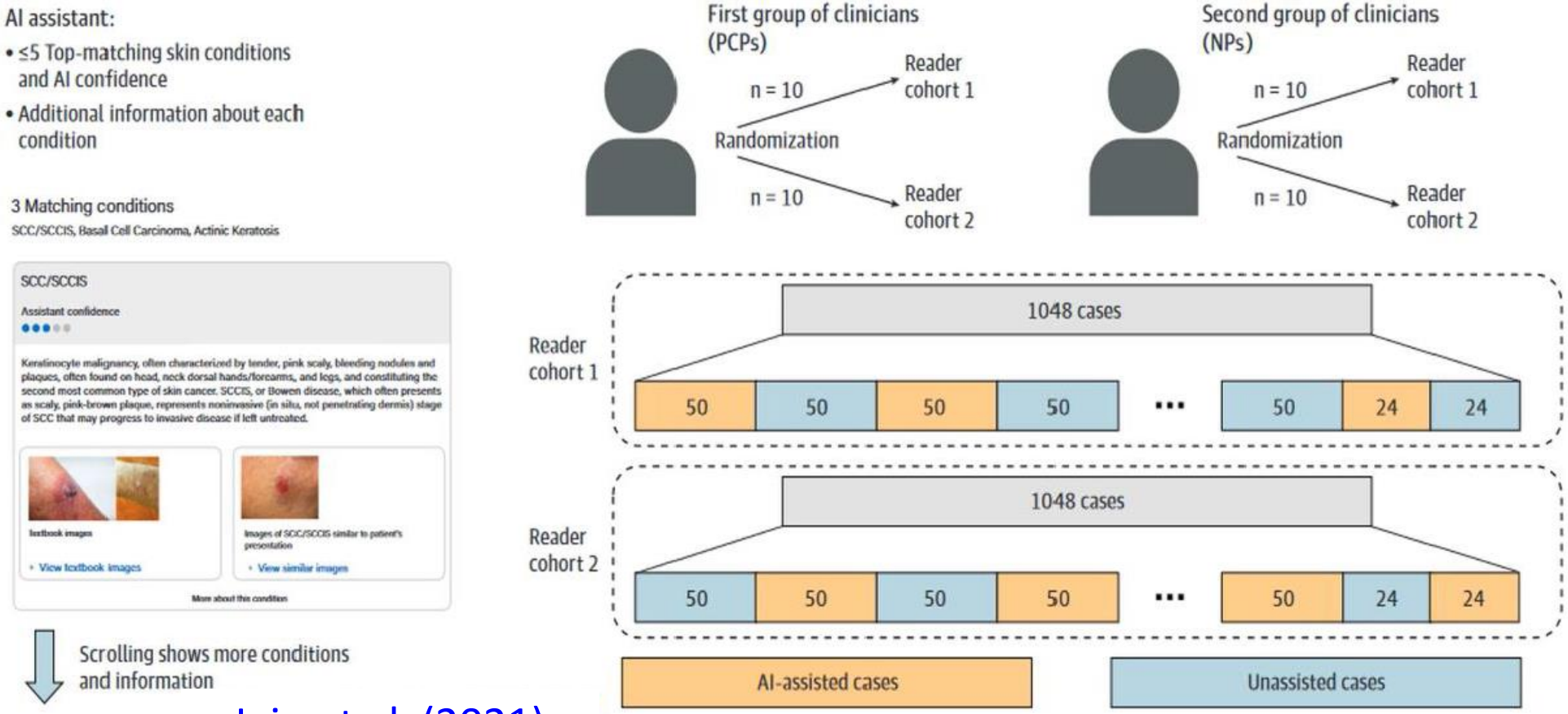
Figure 1. User Interface of the Artificial Intelligence (AI)-Based Assistive Tool and the Study Design



Jain et al. (2021)

Neural Network

(classification and clustering tasks)

- Clustering
- Association
- Dimensionality reduction

Unsupervised machine learning

(unlabelled datasets)

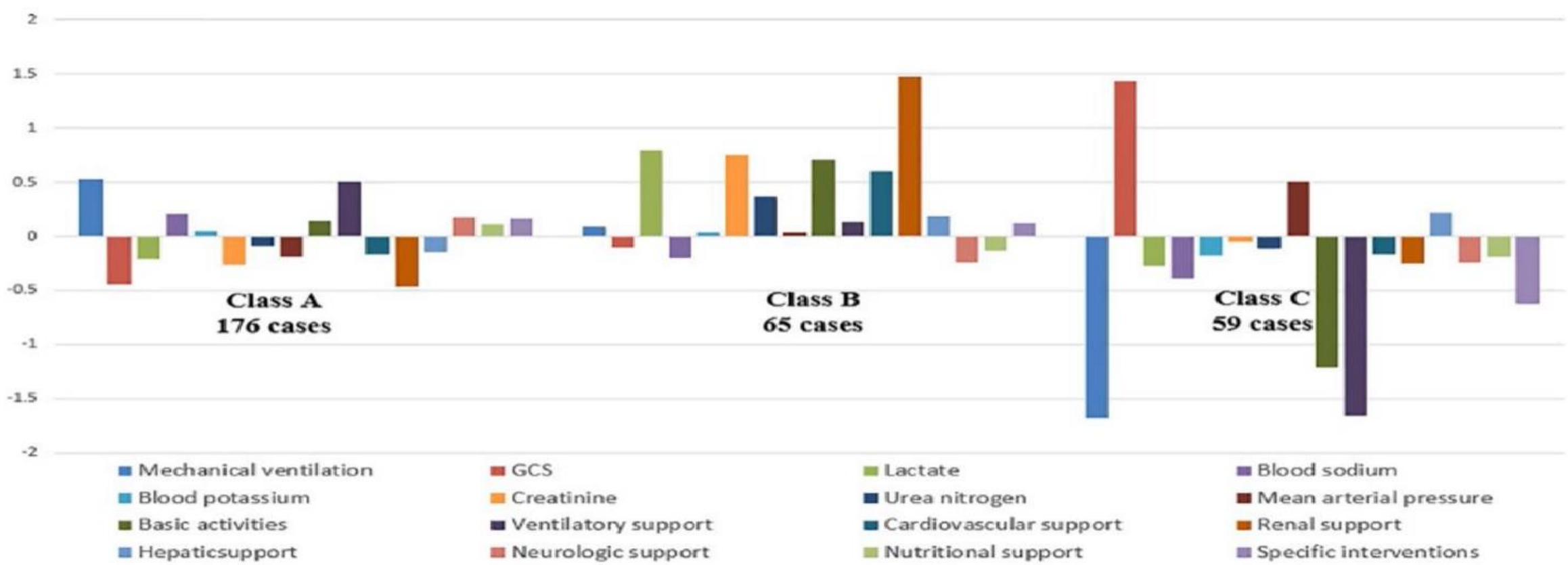


FIGURE 1 Clinical classification of the 300 critical patients enrolled in the study

An et al. (2021)

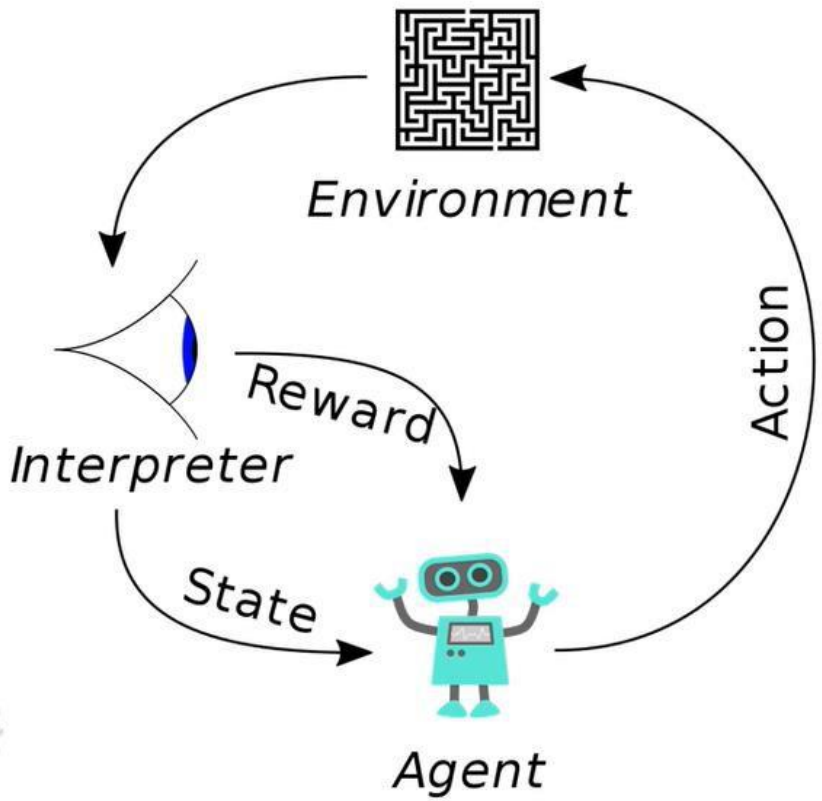
K-means clustering

(clustering tasks)

Reinforcement learning

Agent (algorithm) optimises sequential decisions, repeated over time, in a dynamic system under uncertainty

1) **state** space
2) **action** space
3) **reward** signal
4) system constraints and uncertainty



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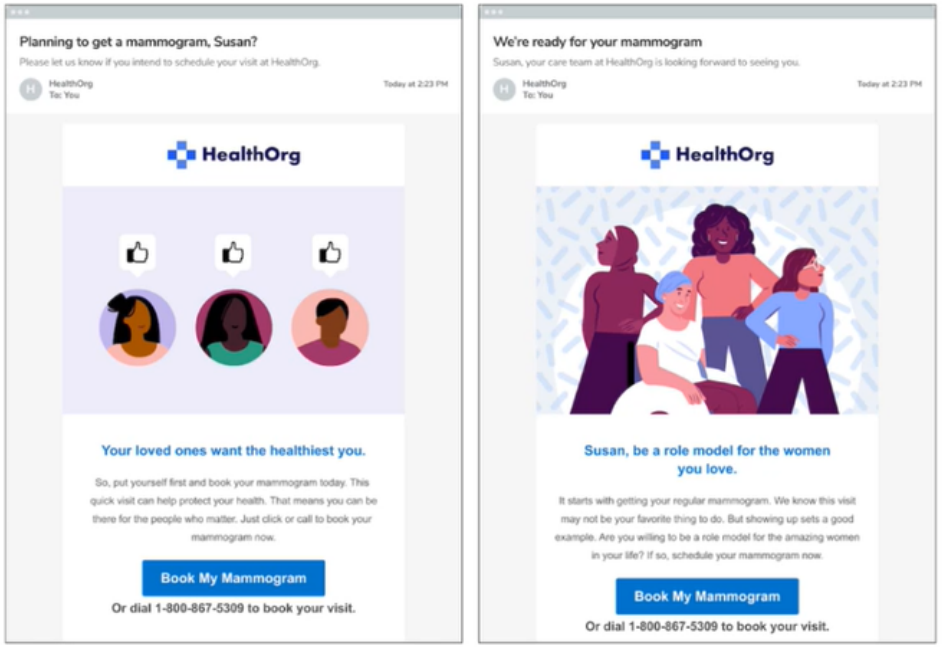
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	n
Cohort 1	■	■	■	■	■									■	■
Cohort 2		■	■	■	■	■									■
Cohort 3			■	■	■	■	■								
Cohort 4				■	■	■	■	■							
Cohort 5					■	■	■	■	■						
Cohort 6						■	■	■	■	■					
Cohort 7							■	■	■	■	■				
Cohort 8								■	■	■	■	■			
Cohort 9									■	■	■	■	■		
Cohort n										■	■	■	■	■	



Bucher et al. (2022)

Natural language processing (NLP)

AI techniques for understanding and responding to written text or voice data

Computational linguistics e.g., sentence segmentation, tokenization, part-of-speech tagging

NLP used in conjunction with statistics and ML, particularly neural networks

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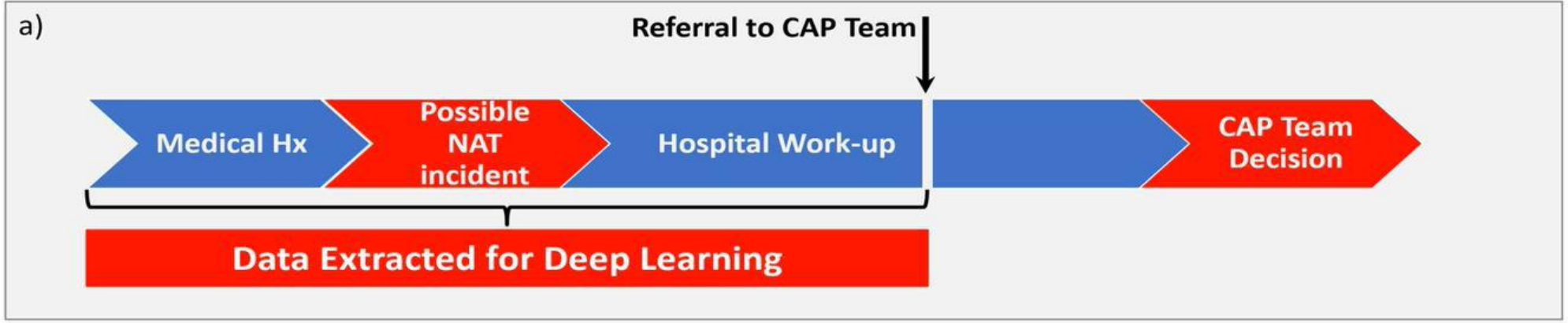

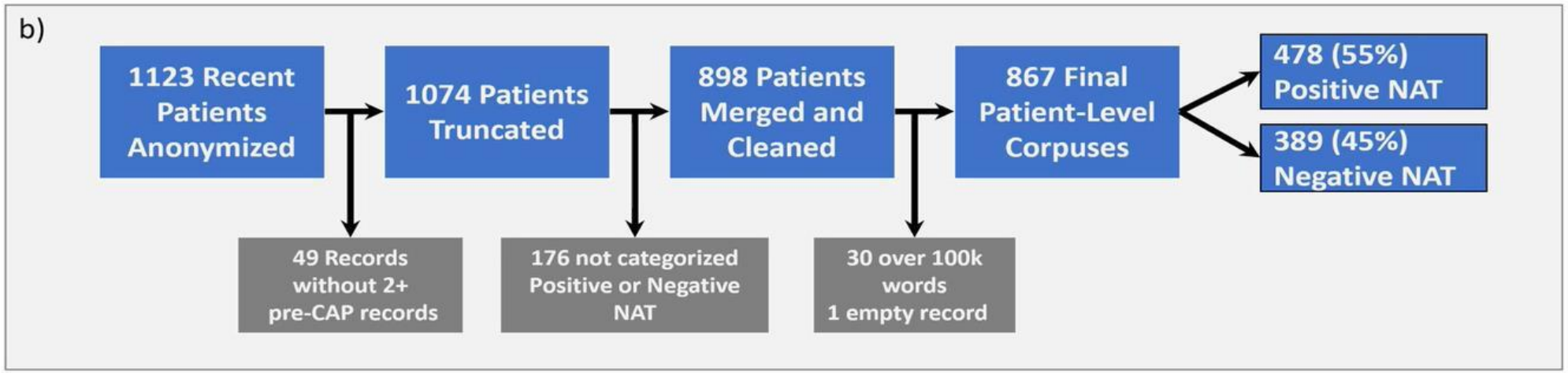

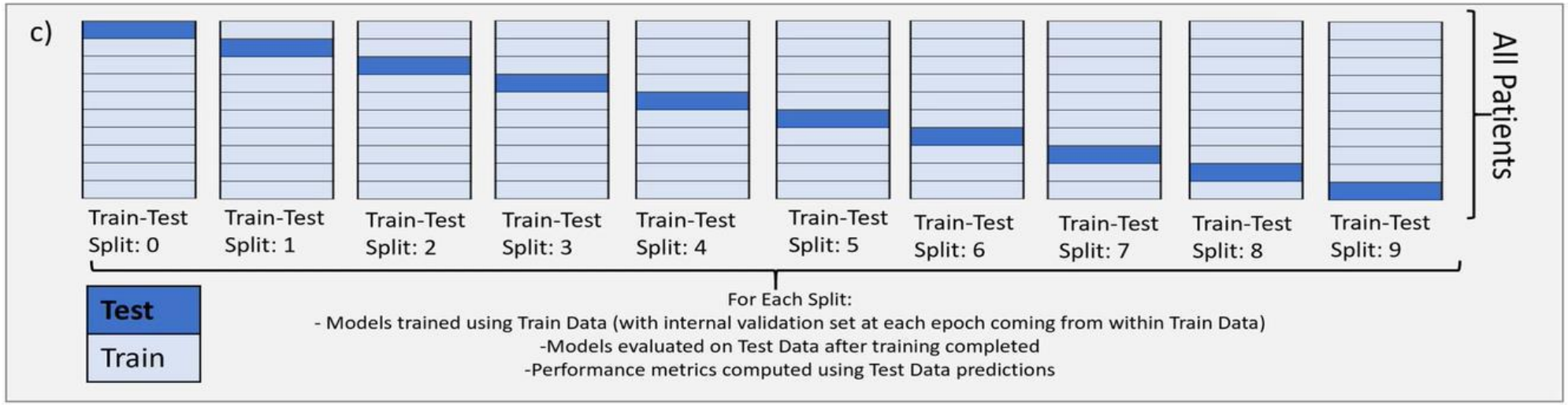

Annapragada et al. (2021)

AGENDA

- History of AI
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JCN Journal of Clinical Nursing
The International Voice of Nursing Research, Theory and Practice

Volume 32, Issue 13-14
July 2023
Pages 2951-2968

REVIEW | Full Access

Artificial intelligence in nursing and midwifery: A systematic review

Siobhán O'Connor PhD, BSc, RGN, Yongyang Yan BSc, RN, Friederike J. S. Thilo PhD, MSc, RN, Heike Felzmann PhD, MA, Dipl Psych, Dawn Dowding BSc, PhD, FAAN, Jung Jae Lee PhD, MSc, BSc

First published: 31 July 2022 | https://doi.org/10.1111/jocn.16478 | Citations: 7

Abstract

Background

Artificial Intelligence (AI) techniques are being applied in nursing and midwifery to improve decision-making, patient care and service delivery. However, an understanding

O'Connor et al. (2023)

Review Questions

- **RQ1:** Are nurses involved in the development, delivery, or use of AI in healthcare, and if so, to what extent?
- **RQ2:** How is AI being employed across the nursing professions in terms of clinical practice, education, research, and policy?
- **RQ3:** What are the benefits, limitations, and risks of AI in nursing?

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Methods – Search strategy

- **Search terms:** related to AI and nursing
- **Databases:** CINAHL, Embase, PubMed, and Scopus, timeframe from 2000 to 2021
- **Include:** AI techniques applied in nursing, English language studies
- **Exclude:** AI under development, simulated or prototyped not applied to any real-world dataset or scenario; conference proceeding, theses, discussion or editorial article, grey literature

Methods – Screening, Critical appraisal, Analysis

- 2076 results found in July 2021
- Titles, abstracts and full-texts screened
- **140 studies included**
- Critical appraisal not undertaken - journal IFs reported as a proxy for quality
- Data extracted to MS Excel for analysis
- Descriptive analytical approach

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Results – Geographic Location

Country	AI Studies
United States	N=65
Canada, China, South Korea, Taiwan	N=10
Japan	N=6
UK	N=4
Finland, Italy, Spain	N=3

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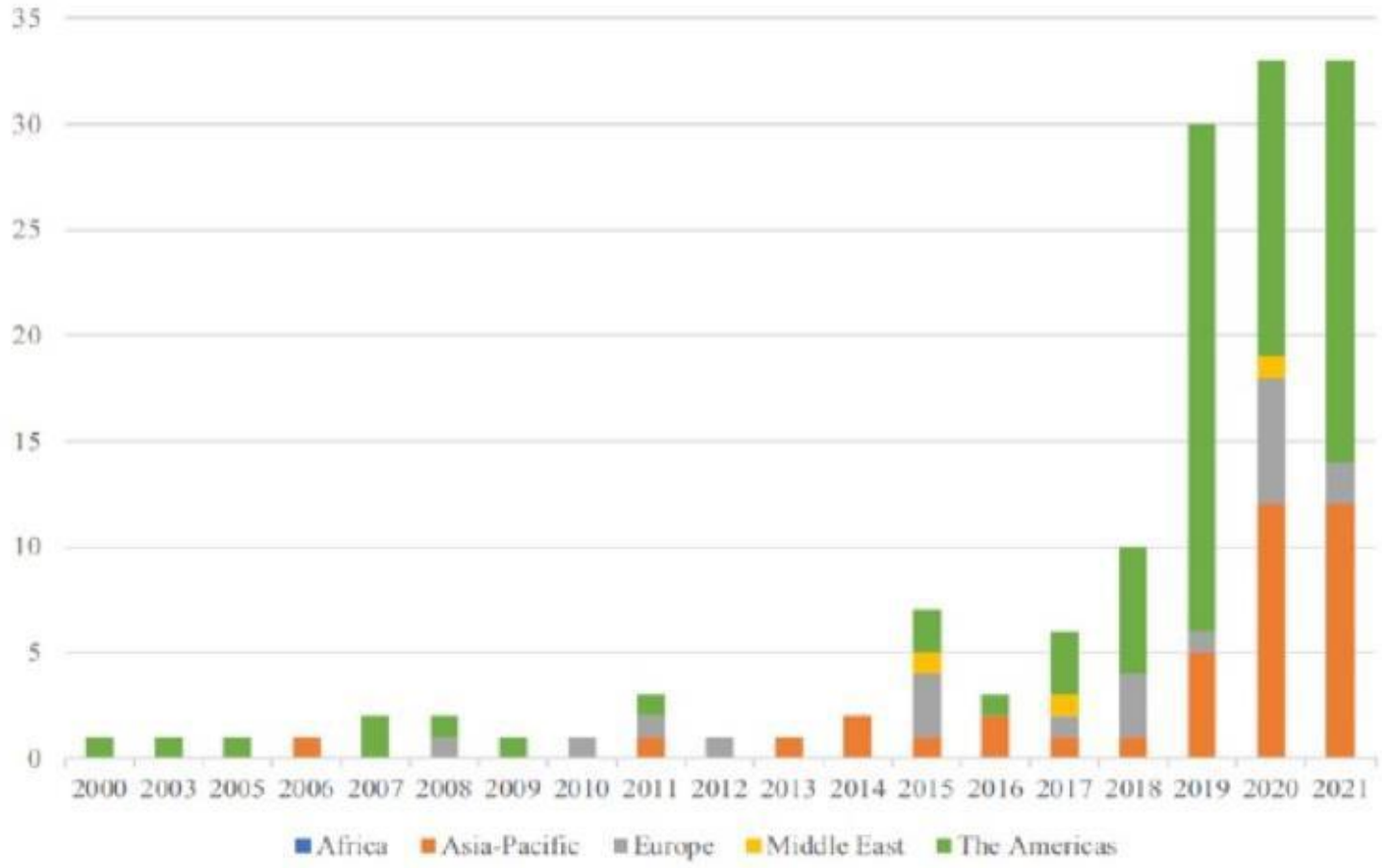
Results – Timeline by Region



Results – Study Characteristics

- Study designs mainly quantitative (retrospective, cross-sectional or cohort)
- 4 studies were mixed methods, 2 used qualitative approaches, and 2 had unclear designs
- Hospital datasets mainly used, a handful used datasets from primary care settings, public health, or universities
- Range of AI algorithms used e.g., decision tree, random forest, artificial neural network, naïve bayes

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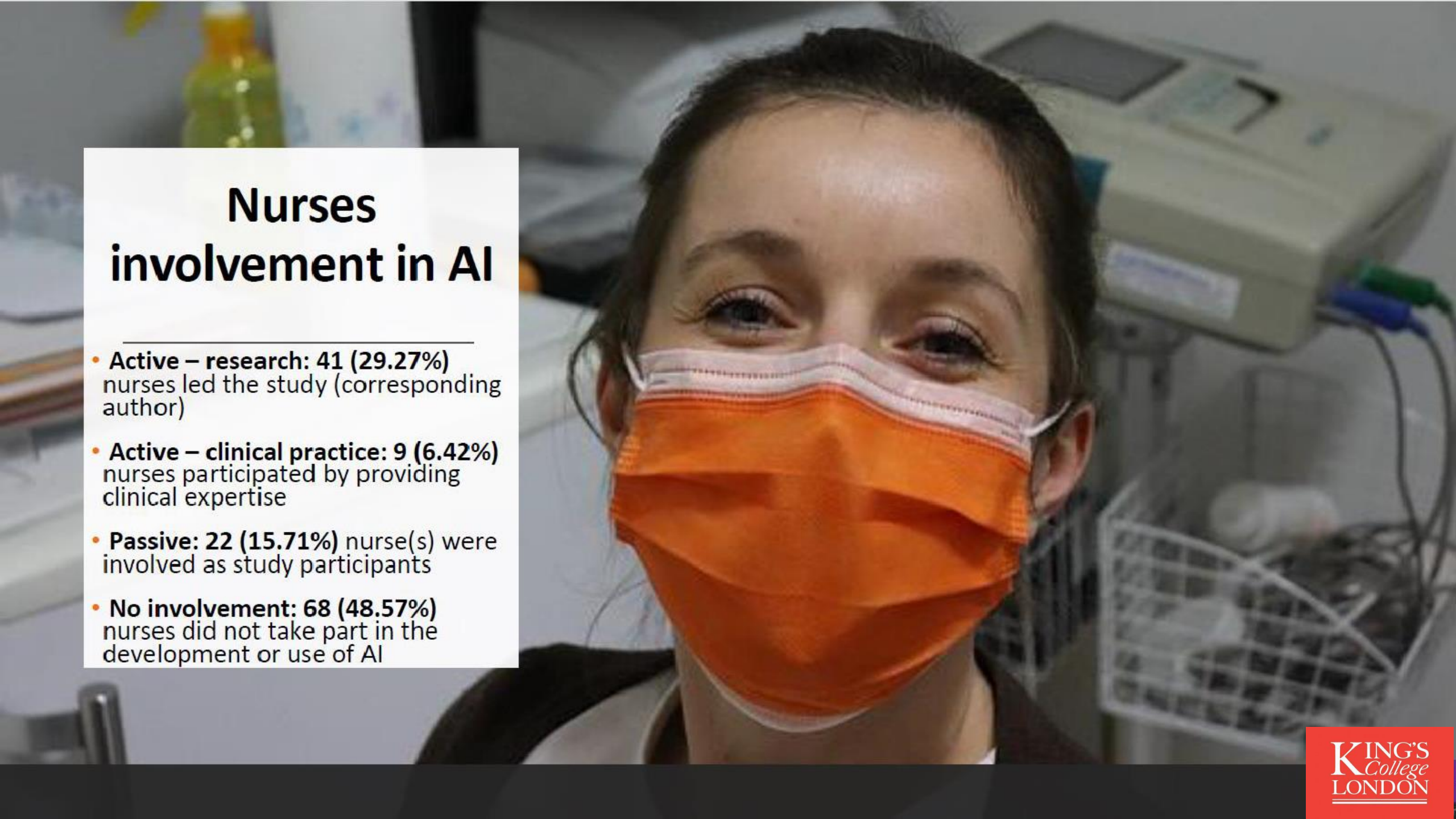

Nurses involvement in AI

- **Active – research: 41 (29.27%)** nurses led the study (corresponding author)
- **Active – clinical practice: 9 (6.42%)** nurses participated by providing clinical expertise
- **Passive: 22 (15.71%)** nurse(s) were involved as study participants
- **No involvement: 68 (48.57%)** nurses did not take part in the development or use of AI

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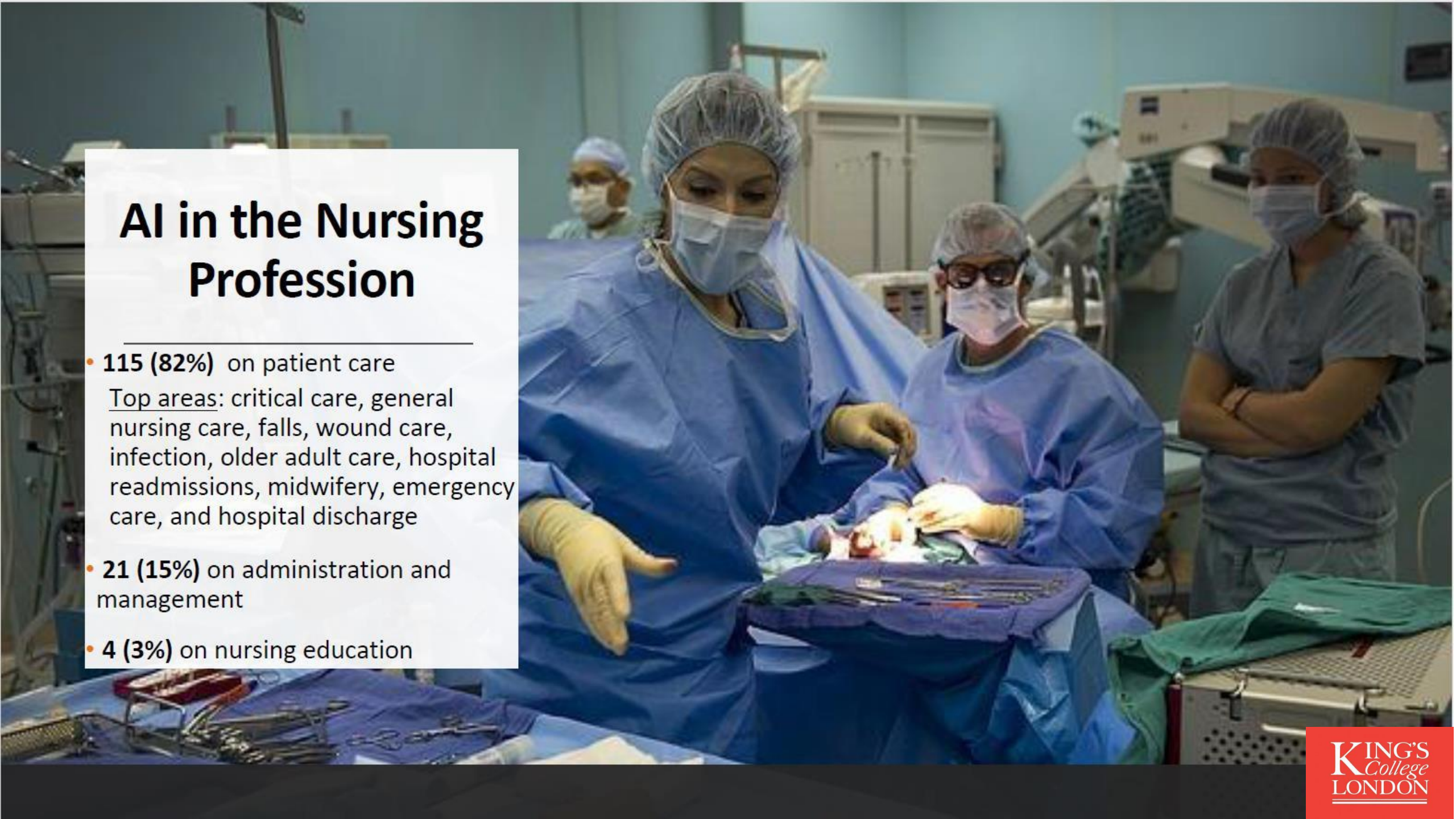
Exemplars of nurses involvement in AI

TABLE 1 Nursing and midwifery involvement in AI (references are located in File S1)

Nursing and midwifery involvement in AI, *N* (%)	
Active – research, 41 (29.27%) *A nurse or midwife led the application of AI and was the corresponding author on the scientific study*	
Exemplar 1: Corresponding and first author is a nursing researcher at a European university with a MSc and PhD Exemplar 2: Corresponding and first author is a nursing researcher at a university in the USA Exemplar 3: Corresponding and last author is a nursing researcher at a university in Taiwan with a PhD	Alderden et al. (2018); An et al. (2021); Back, Jin, Jin, & Lee (2016); Bagnasco et al. (2015); Bakken et al. (2005); Bose et al. (2019); Brom et al. (2020); Chien et al. (2021); Cho, Park, Kim, Lee, & Bates (2013); Chun et al. (2021); Ferreira et al. (2020); Fritz & Dermody (2019) Hannaford et al. (2021); Hu et al. (2020); Huang et al. (2021); Hyun et al. (2009); Im & Chee (2011); Jeon et al. (2020); Jung, Park, & Hwang (2020); Koleck et al. (2021); Kwon et al. (2019); Ladios-Martin et al. (2020); Lee et al. (2020); Lee et al. (2021); Lee et al. (2011); Lee et al. (2020); Li & Mathews (2017); Ma et al. (2020); Nakagami et al. (2021); Park et al. (2020); Popejoy et al. (2015); Song et al. (2021); Sullivan, Hewner, Chandola, & Westra (2019); Topaz et al. (2016); Topaz, Murga, Bar-Bachar, et al. (2019); Topaz, Murga, Gaddis, et al. (2019); Woo et al. (2021); Yakusheva et al. (2021); Yang et al. (2021); Yu, Zhang et al. (2020); Zhou et al. (2021)
Active – clinical practice, 9 (6.42%) *Nurses or midwives participated in AI research by providing clinical expertise for example by validating and checking the results of a predictive model*	
Exemplar 1: Triage records (19,652) were reviewed by 7 study clinicians, all practitioners in emergency health care, to correct potential nurse errors in ESI assignment and then to validate the trained model, 3 expert clinicians (doctorly prepared emergency nurse with nationally recognised expertise in ED triage and 2 emergency physicians) were chosen from the study	Ivanov et al. (2021); Jain et al. (2021); Korach et al. (2019); Liao et al. (2015); Liao et al. (2014); Meyfroidt et al. (2011); Savarraj et al. (2020); Sterling et al. (2020); Travers & Haas (2003)

O'Connor et al. (2023)



AI in the Nursing Profession

- **115 (82%)** on patient care

  Top areas: critical care, general nursing care, falls, wound care, infection, older adult care, hospital readmissions, midwifery, emergency care, and hospital discharge

- **21 (15%)** on administration and management

- **4 (3%)** on nursing education

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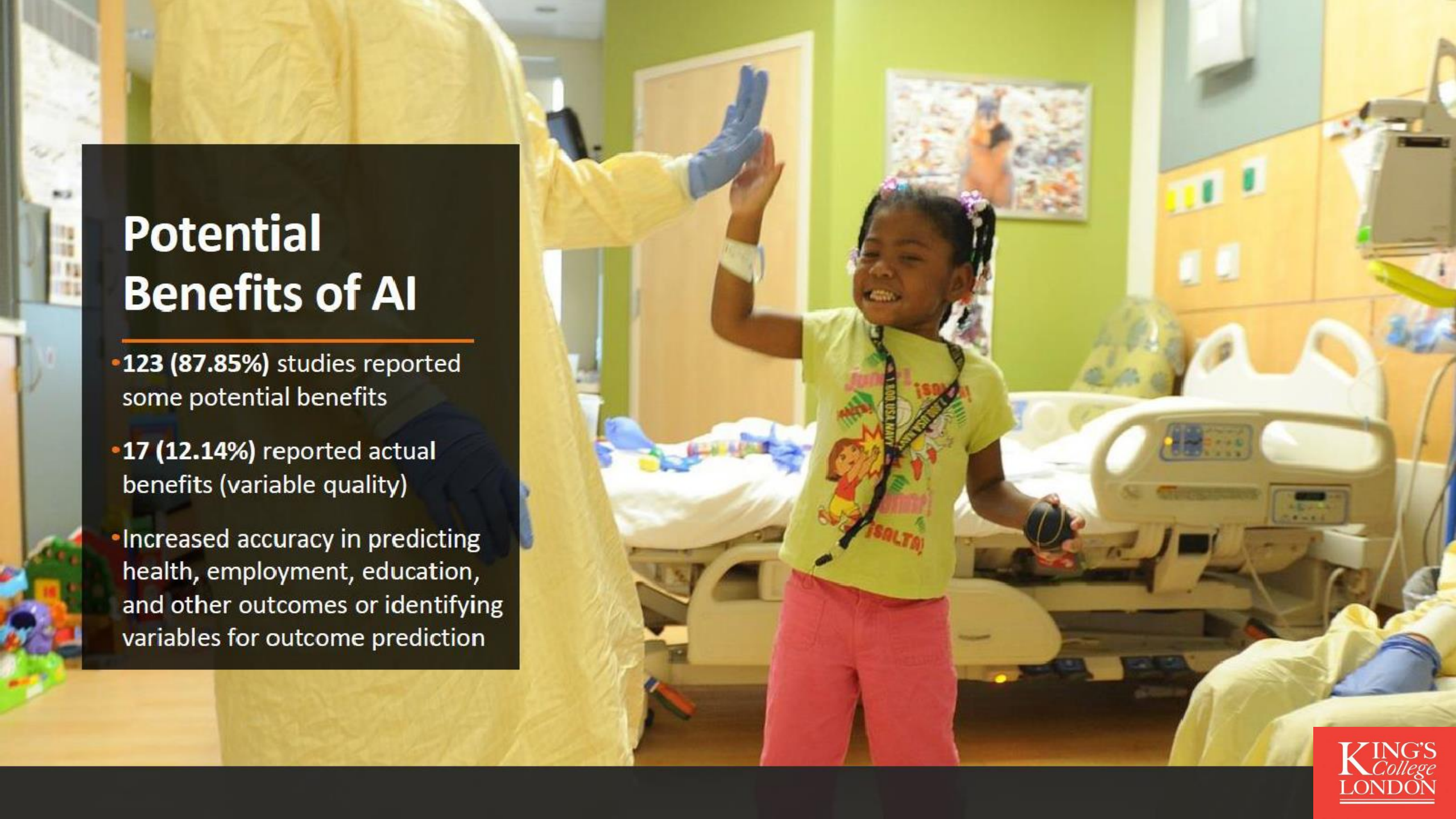
Exemplars of AI in nursing

TABLE 2 AI employed across the nursing and midwifery professions (references are located in File S1)

AI employed across the nursing and midwifery professions, *N* (%)	
Direct patient care, 115 (82.14%)	
(1) Critical care, 14 (10.00%)	
Exemplar 1: To develop a patient classification system that stratifies patients admitted to the intensive care unit based on their disease severity and care needs.	Alderden et al. (2018); An et al. (2021); Cho, Park, Kim, Lee, & Bates (2013); Davoudi et al. (2019); Huang et al. (2021); Joshi et al. (2019); Marafino et al. (2015); Meyfroidt et al. (2011); Rojas et al. (2018); Sun et al. (2019); Travers & Haas (2003); Waudby-Smith et al. (2018); Wellner et al. (2017); Zampieri et al. (2019)
Exemplar 2: To predict the risk of ICU transfer within the next 24 h for coronavirus patients using hospital EMR data	

O'Connor et al. (2023)



Potential Benefits of AI

- **123 (87.85%)** studies reported some potential benefits
- **17 (12.14%)** reported actual benefits (variable quality)
- Increased accuracy in predicting health, employment, education, and other outcomes or identifying variables for outcome prediction

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Exemplars of potential benefits of AI

TABLE 3 Benefits of AI in nursing and midwifery (references are located in File S1)

Benefits of AI in nursing and midwifery, *N* (%)	
Potential benefits (development and testing of AI or personal perspectives on AI) – 123 (87.85%)	
Increased accuracy of predicted health, employment, education and other outcomes, 90 (64.28%)	
Exemplar 1: A weighted logistic regression using 40 EHR-derived features from the first 24 h of an ICU admission outperformed the nurse-calculated Braden score in recall and matched its precision, showing precision 0.09 and recall 0.71 for future pressure ulcer development.	Alderden et al. (2018); Abad et al. (2021); Ambagtsheer et al. (2020); Annapragada, Donaruma-Kwoh, Annapragada, & Starosolski (2021); Bagnasco et al. (2015); Beauchet et al. (2018); Brom et al. (2020); Cheng et al. (2020); Chien et al. (2021); Chun et al. (2021); Cramer et al. (2019); El-Solh et al. (2000); Fairie et al. (2021); Ferreira et al. (2020); Fergus, Hussain, Al-Jumeily, Huang, & Bouguila (2017); Fergus, Selvaraj, & Chalmers (2018); Fralick et al. (2021); Gannod et al. (2019); Ge et al. (2019); Ghi et al. (2022); Goyal et al. (2019); Guidi, Pollonini, Dacso, & Iadanza (2015); Hannaford et al. (2021); Heo et al. (2020); Horng et al. (2017); Hu et al. (2020); Hu et al. (2021); Huang et al. (2021); Ivanov et al. (2021); Jeon et al. (2020); Jhee et al. (2019); Jung, Park, & Hwang (2020); Karhade et al. (2018); Khanjankhani et al. (2017); Komaki et al. (2021); Korach et al. (2019); Koto, Fahey, Meier, LeDrew, & Loring (2019); Kwon et al. (2019); Ladios-Martin et al. (2020); Ladstätter et al. (2010); Ladstätter et al. (2016); Lee, Ahn et al. (2020); Lee, Chou et al. (2020); Li & Mathews (2017); Lin, Hsu, Hsu, & Cheng (2014); Ma et al. (2020); Marafino et al. (2015); Meyfroidt et al. (2011); Mohammadi et al. (2020); Moseley & Mead (2008); Mufti et al. (2019); Nakagami et al. (2021); Nakatani et al. (2020); Nuutinen, Leskelä, Suojalehto, Tirronen, & Komssi (2017); Ocagli et al. (2020); Ogink, Karhade, Thio, Gormley, et al. (2019); Ogink, Karhade, Thio, Hershman, et al. (2019); Olling, Nyeng, & Wee (2018); Park et al. (2020); Rittenhouse et al. (2019); Rojas et al. (2018);
Exemplar 2: The neural network achieved a sensitivity of 85.7% (95% confidence interval [CI], 83.7–89.4) and specificity of 94.1% (95% CI, 84.4–99.1) in identifying discharge destination with a corresponding area under the curve of 95.7% (95% CI, 92.1–98.3).	
Exemplar 3: Hypoglycaemia occurred in 16% of general medicine admissions and 13% of cardiovascular surgery admissions. The area under the curve for the models in the held-out validation set was approximately 0.80 on the GIM ward and 0.82 on the CV ward. Among the patients at the highest decile of risk, the positive predictive value was	

O'Connor et al. (2023)

Limitations of AI

- **96 (68.75%)** quality of the dataset could limit accuracy/transferability
- **15 (10.71%)** other AI techniques could yield different results
- **10 (7.14%)** retrospective data may limit future predictive ability
- **9 (6.42%)** professionals need to interpret results for clinical utility

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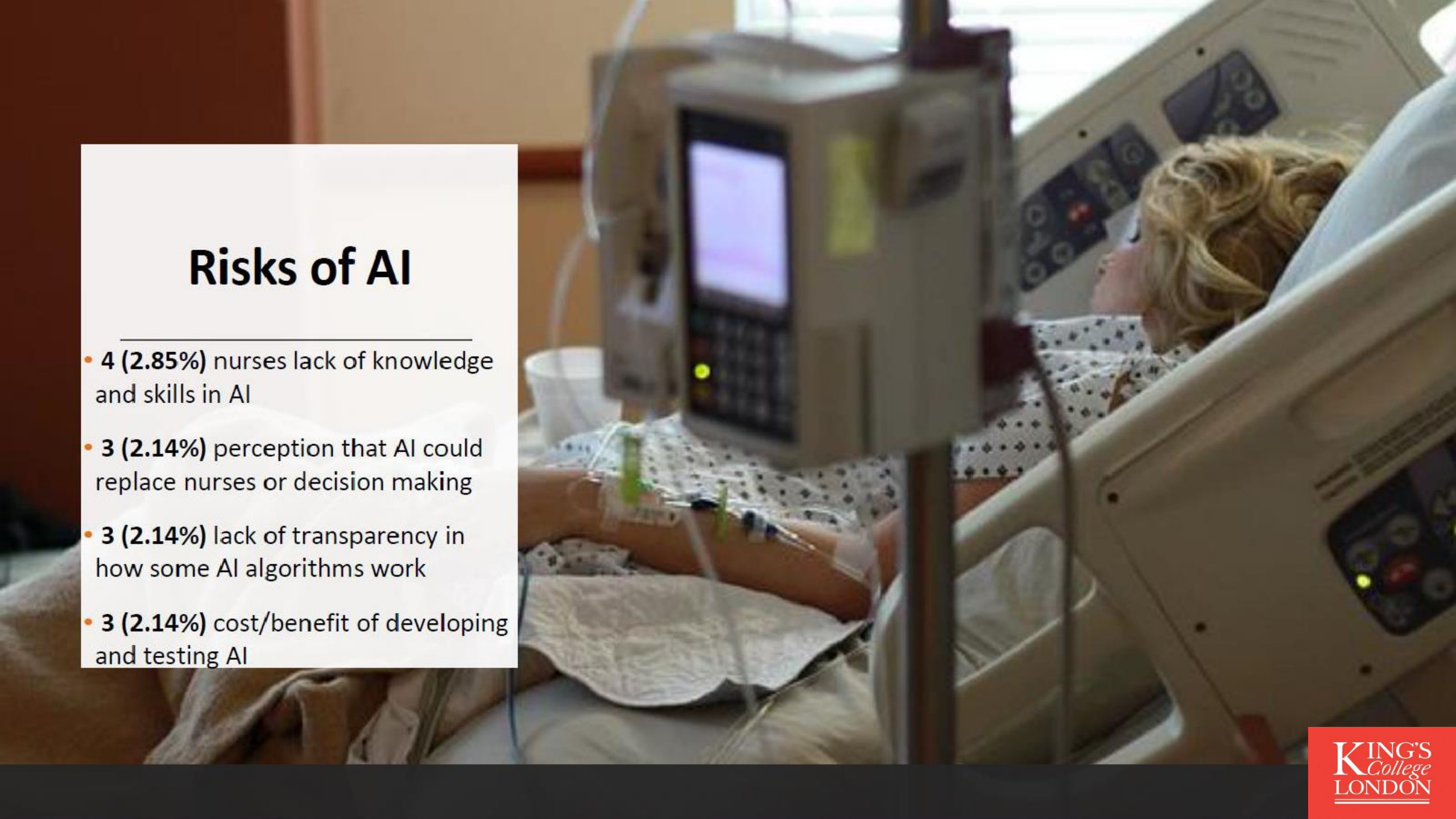
Exemplars of limitations of AI in nursing

TABLE 4 Limitations of AI in nursing and midwifery (references are located in File S1)

Limitations of AI in nursing and midwifery, *N* (%)	
Small size and low quality of the dataset, 96 (68.75%)	
Exemplar 1: Missing datasets, although this can be accounted for in some ML techniques. Other variables aside from the APACHE score could be included. Exemplar 2: Potential bias in existing datasets with missing data could skew results. Exemplar 3: Larger samples and multicentre datasets could improve the model's performance. Exemplar 4: Some AI requires a large amount of data in order to be efficient which may not be feasible for every patient population or problem. Exemplar 5: Clinical documentation may not be perfect during crises, when normal documentation standards are relaxed due to the high work burden of clinicians leading to unavailable or missing data.	Abad et al. (2021); Alderden et al. (2018); Ambagtsheer et al. (2020); An et al. (2021); Annapragada, Donaruma-Kwoh, Annapragada, & Starosolski (2021); Antoniadi, Galvin, Heverin, Hardiman, & Mooney (2020); Back, Jin, Jin, & Lee (2016); Bagnasco et al. (2015); Beauchet et al. (2018); Brom et al. (2020); Cheng et al. (2020); Cho, Park, Kim, Lee, & Bates (2013); Chun et al. (2021); Cooper, Hughes, Verghese, Just, & Markham (2021); Cramer et al. (2019); El-Solh et al. (2000); Fergus, Hussain, Al-Jumeily, Huang, & Bouguila (2017); Fergus, Selvaraj, & Chalmers (2018); Ferreira et al. (2020); Fralick et al. (2021); Gannod et al. (2019); Ge et al. (2019); Goyal et al. (2019); Guidi, Pollonini, Dacso, & Iadanza (2015); Hannaford et al. (2021); Heo et al. (2020); Horng et al. (2017); Hu et al. (2020); Huang et al. (2021); Hunter et al. (2012); Hur, Jin, Jin, & Lee (2019); Ivanov et al. (2021); Jhee et al. (2019); Joshi et al. (2019); Jung, Park, & Hwang (2020); Karhade et al. (2018); Komaki et al. (2021); Korach et al. (2020); Kwon et al. (2019); Ladios-Martin et al. (2020); Ladstätter et al. (2010); Ladstätter et al. (2016); Lee et al. (2011); Lee, Ahn et al. (2020); Lee, Chou et al. (2020); Li et al. (2019); Li & Mathews (2017); Liao et al. (2014); Lin, Hsu, Hsu, & Cheng (2014); Lindberg et al. (2020); Ma et al. (2020); Marafino et al. (2015); Meyfroidt et al. (2011); Mohammadi et al. (2020); Mufti et al. (2019); Nakagami et al. (2021);

O'Connor et al. (2023)



Risks of AI

- **4 (2.85%)** nurses lack of knowledge and skills in AI
- **3 (2.14%)** perception that AI could replace nurses or decision making
- **3 (2.14%)** lack of transparency in how some AI algorithms work
- **3 (2.14%)** cost/benefit of developing and testing AI

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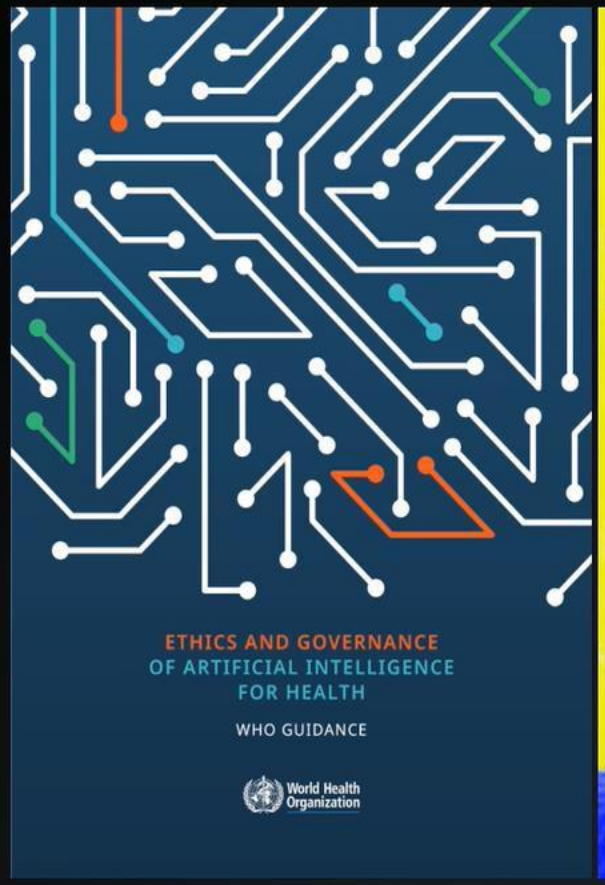
Exemplars of risks of AI in nursing

TABLE 5 Risks of AI in nursing and midwifery (references are located in File S1)

Risks of AI in nursing and midwifery, *N* (%)	
Lack of AI expertise among nurses, 4 (2.85%)	
Exemplar 1: They had a general lack of knowledge regarding AI and a lack of knowledge about AI technologies. Exemplar 2: Nursing students, practising RNs and nursing faculty acknowledge they require the requisite knowledge, skills and competencies in this area. Although RNs reported they might not recognise how AI is integral to nursing practice.	Abdullah & Fakieh (2020); Fritz & Dermody (2019); Sandhu et al. (2020); Swan (2021)
Automate jobs and replace staff or decision-making, 3 (2.14%)	
Exemplar 1: Overall, participants feared artificial intelligence would replace employees and ... fear of job replacement by AI. Exemplar 2: Not to use the results of data mining to replace the clinicians' professional judgement, rather to provide another perspective for problem solving a clinical phenomenon.	Abdullah & Fakieh (2020); Hirdes, Poss, & Curtin-Telegdi (2008); Lee et al. (2011);
Lack of transparency around how AI techniques work, 3 (2.14%)	
Exemplar 1: Potential barriers to positive clinical reception of EWS 2.0 including... lack of transparency of the machine learning algorithm Exemplar 2: the resulting potential for clinical resistance to a "black box" approach	Ginestra et al. (2019); Yokota, Endo, & Ohe (2017); Zhu, Zhang, Hirdes, & Stolee (2007)
Cost of collecting and analysing digital datasets outweigh the benefits of AI, 3 (2.14%)	
Exemplar 1: The trade-offs between generating additional data required to achieve high accuracy must be offset against the potential clinician burden implied by a	Ambagtsheer et al. (2020); Ginestra et al. (2019); Sullivan, Howpage, Chandola, & Westra (2019)

O'Connor et al. (2023)



World Health Organization (WHO, 2021)

World Health Organization (WHO, 2022)

UNESCO (2018)

UNESCO (2022)

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Algorithmic bias in health care: Opportunities for nurses to improve equality in the age of artificial intelligence

Siobhan O'Connor • Richard G. Booth

Open Access • Published: November 14, 2022 • DOI: https://doi.org/10.1016/j.outlook.2022.09.003 •

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Keywords

Algorithms • Artificial Intelligence • Bias • Health care • Machine learning • Natural language processing • Neural networks • Nursing

Artificial Intelligence (AI) consists of a range of sophisticated computational techniques, encompassing machine learning algorithms and natural language processing among others, that are lauded as a way to improve clinical decision making, patient care, and health service delivery. A recent systematic review of AI in nursing and midwifery found many clinical, managerial, and educational applications of these predictive algorithms over the last 20 years covering areas such as wound care, critical care, falls, infection control, emergency care, older adult care, and education among others (O'Connor et al., 2022). For example, An et al., 2021 employed a number of machine learning algorithms to develop a predictive model that stratified patients admitted to intensive care units based on disease severity and care needs, while Lee et al., 2020 developed a mobile app incorporating a convolutional neural network to help predict burnout among nurses, and Narang et al., 2021 utilized a deep learning algorithm to train nurses to use an echocardiogram. Despite numerous identified benefits of AI in health care, it can also introduce a host of risks – one of the most pressing being *algorithmic bias*.

Patients of certain ethnicities, religious backgrounds, ages, and those with differing sexual preferences and genders can face discrimination when accessing health care in some countries (Dobrowolska et al., 2019; Irvin et al., 2014; Khera et al.,

O'Connor & Booth (2022)

Discussion – Implications for nursing

- Collect digital health data to ensure AI can be developed, tested, and if useful implemented
- Seek opportunities to develop, test, and if effective implement AI-based technologies to improve patient care and clinical practice
- Become involved in AI governance to ensure AI techniques are applied appropriately

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Discussion – Implications for nursing

- Create curricula on AI and integrate this into nursing programmes to teach students
- Conduct more rigorous, interdisciplinary research examining if AI-based technologies are effective in improving patient and other outcomes
- Examine risks and limitations of AI in more detail
- Explore impact of AI-based technologies on nurses workflow and workload and how to implement AI tools

Strengths and Limitations of Review

- **Strengths –** independent reviewers for screening, best practice guidelines e.g., PRISMA
- **Limitations –** some search terms missing, no computer science or engineering databases searched, no critical appraisal (strength of evidence missing), certain publication types excluded (O'Connor et

O'Connor et al. (2023)

Conclusion

- More digital nursing and health datasets
- More informatics expertise in the nursing workforce
- Collaborate with colleagues to test AI algorithms and if effective implement AI based technologies in healthcare

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Next Steps

- Education – developing and integrating AI curricula into nursing education at King's College London
- Publications on AI in nursing education (O'Connor & ChatGPT, 2023; O'Connor, 2022; O'Connor 2021)

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ELSEVIER

Nurse Education in Practice

Volume 64, October 2022, 103451

Editorial

Teaching artificial intelligence to nursing and midwifery students

Siobhán O'Connor [1]

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ELSEVIER

Nurse Education in Practice

Volume 66, January 2023, 103537

Editorial

Open artificial intelligence platforms in nursing education: Tools for academic progress or abuse?

Siobhan O'Connor [a 1], ChatGPT [b]

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Clinical Practice
Discussion
Artificial intelligence

Keywords Artificial intelligence/ Nursing education/Teaching/Learning

This article has been double-blind peer reviewed

In this article...

- Artificial intelligence (AI) and its potential role in nursing education
- How ChatGPT and other generative AI tools could change nursing education
- Why generative AI tools should be considered for use by nurse educators and students

Artificial intelligence in nursing education 1: strengths and weaknesses

Key points

Artificial intelligence is being used to create digital tools that generate text, images and videos

Technologies supported by artificial intelligence could transform nursing education

Generative artificial intelligence tools may act as assistants

Authors Siobhan O'Connor is senior lecturer, Emilia Leonowicz is nursing student, both at University of Manchester; Bethany Allen is digital nurse implementer, The Christie NHS Foundation Trust; Dominique Denis-Lalonde is nursing instructor, University of Calgary, Canada.

Abstract Artificial intelligence (AI) refers to the application of algorithms and computational models that enable machines to exhibit cognitive abilities – including learning, reasoning, pattern recognition and language processing – that are similar to those of humans. By analysing vast amounts of data (text, images, audio and video), sophisticated digital tools, such as ChatGPT, have surpassed previous forms of AI and are now being used by students and educators in universities worldwide. Nurse educators could use these tools to support student learning, engagement and assessment. However, there are some drawbacks of which nurse educators and students should be aware, so they understand how to use AI tools appropriately in professional practice. This, the first of two articles on AI in nursing education, discusses the strengths and weaknesses of generative AI and gives recommendations for its use.

O'Connor, Leonwicz, Allen, & Denis-Lalonde (2023)

Clinical Practice
Discussion
Artificial Intelligence

Keywords Artificial intelligence/Nurse educator/Student/Teaching/Learning

This article has been double-blind peer reviewed

In this article...

- The role of artificial intelligence (AI), particularly generative AI, in nursing education
- Opportunities that ChatGPT and other generative AI tools could bring to nursing education
- Why generative AI tools may present threats for nurse educators and nursing students

Artificial intelligence in nursing education 2: opportunities and threats

Key points

Artificial intelligence is being used to create digital tools that can generate text, images, audio and videos quickly and easily

These artificial intelligence-based digital tools could support nursing education in university and clinical settings

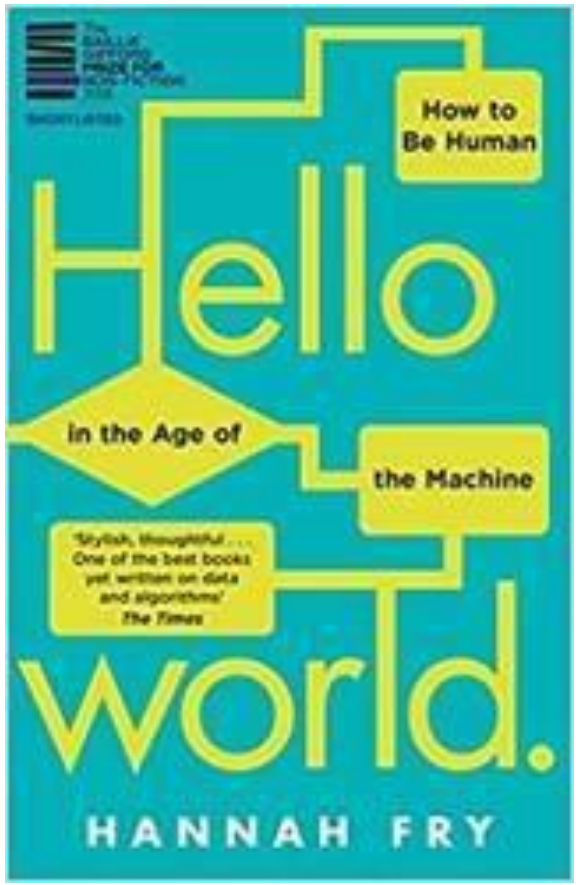
Generative artificial intelligence tools

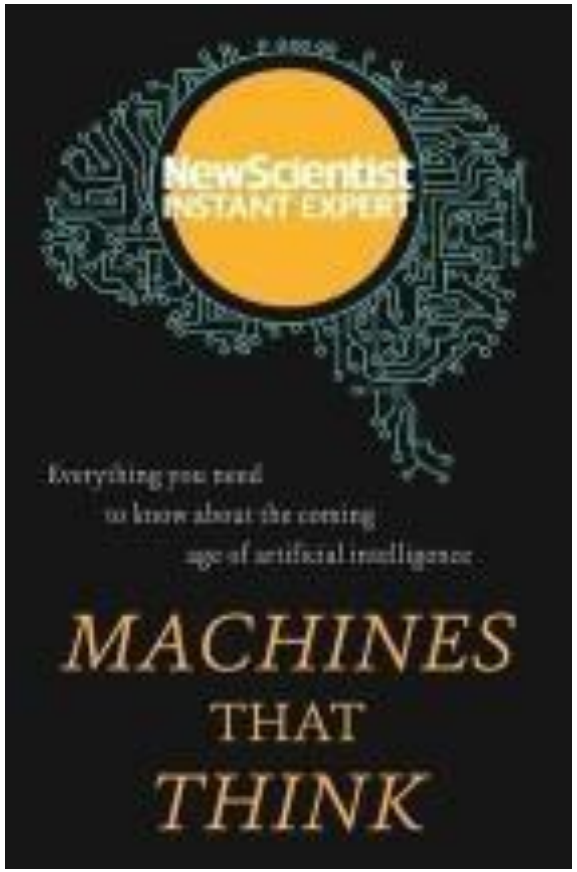
Authors Siobhan O'Connor is senior lecturer, Andi Fajrin Permana is nursing student, both at King's College London; Sam Neville is chief nursing informatics officer, Mid and South Essex NHS Foundation Trust; Dominique Denis-Lalonde is nursing instructor, University of Calgary, Canada.

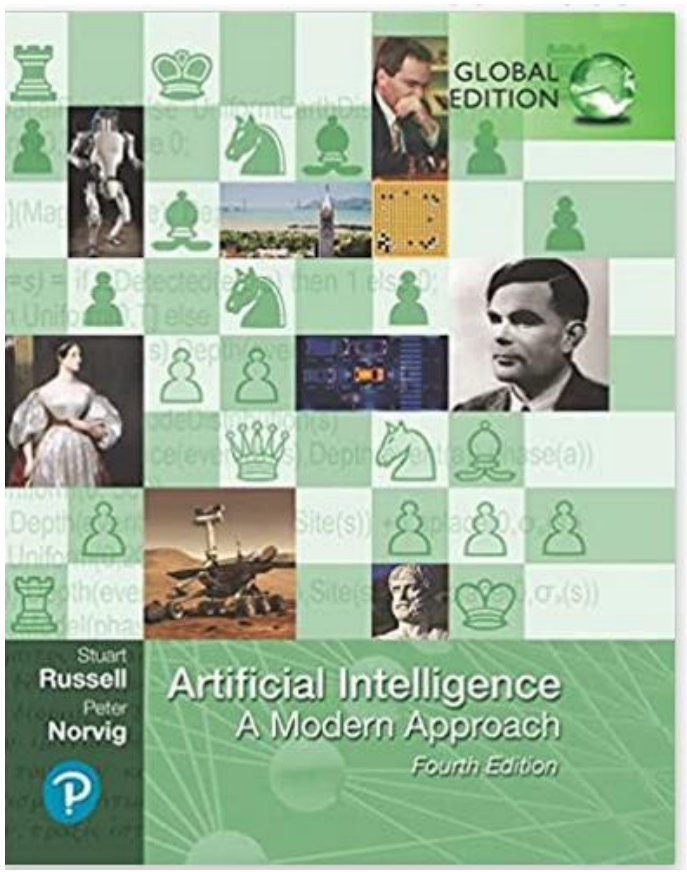
Abstract Artificial intelligence (AI) is being used to create new digital tools, such as the chatbot ChatGPT, which are starting to be used for teaching and learning in higher education. Nurse educators could use the opportunities offered by AI-based digital tools to enhance how they teach clinical knowledge and skills to students. Nursing students should learn to use AI tools appropriately, not just by understanding the opportunities they offer, but also by being aware of the threats they may pose to academic integrity, professional practice, and patient care. This second of two articles on AI in nursing education explores these opportunities and threats, and how to use generative AI in the context of nursing education.

Citation O'Connor S et al (2023) Artificial intelligence in nursing education 2: opportunities and threats. *Nursing Times* [online]; 119: 11.

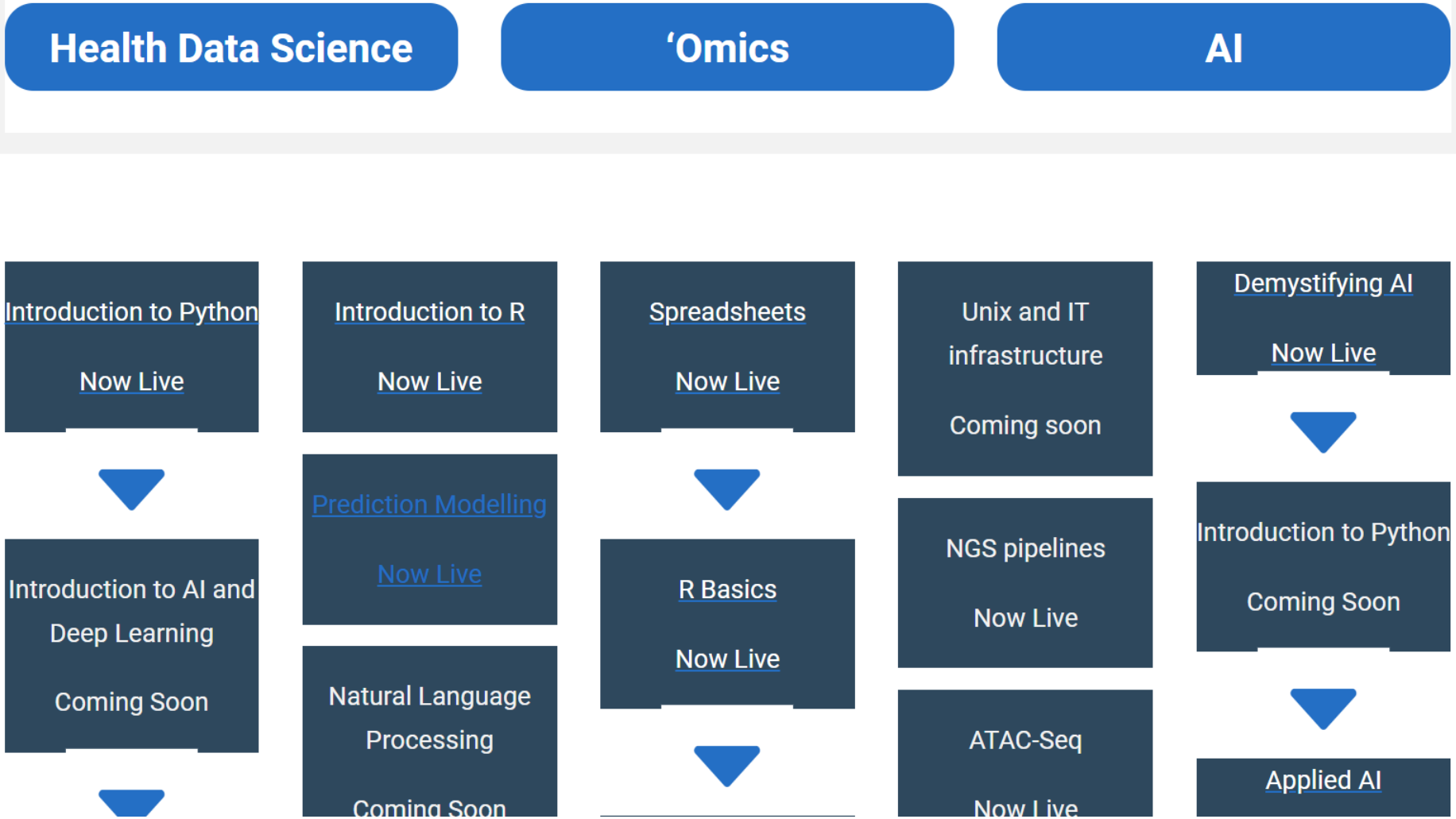
O'Connor, Permana, Neville, & Denis-Lalonde (2023)







Fry (2018) New Scientist (2017) Russell & Norvig (2022)



https://innovationscholars.er.kcl.ac.uk/training/

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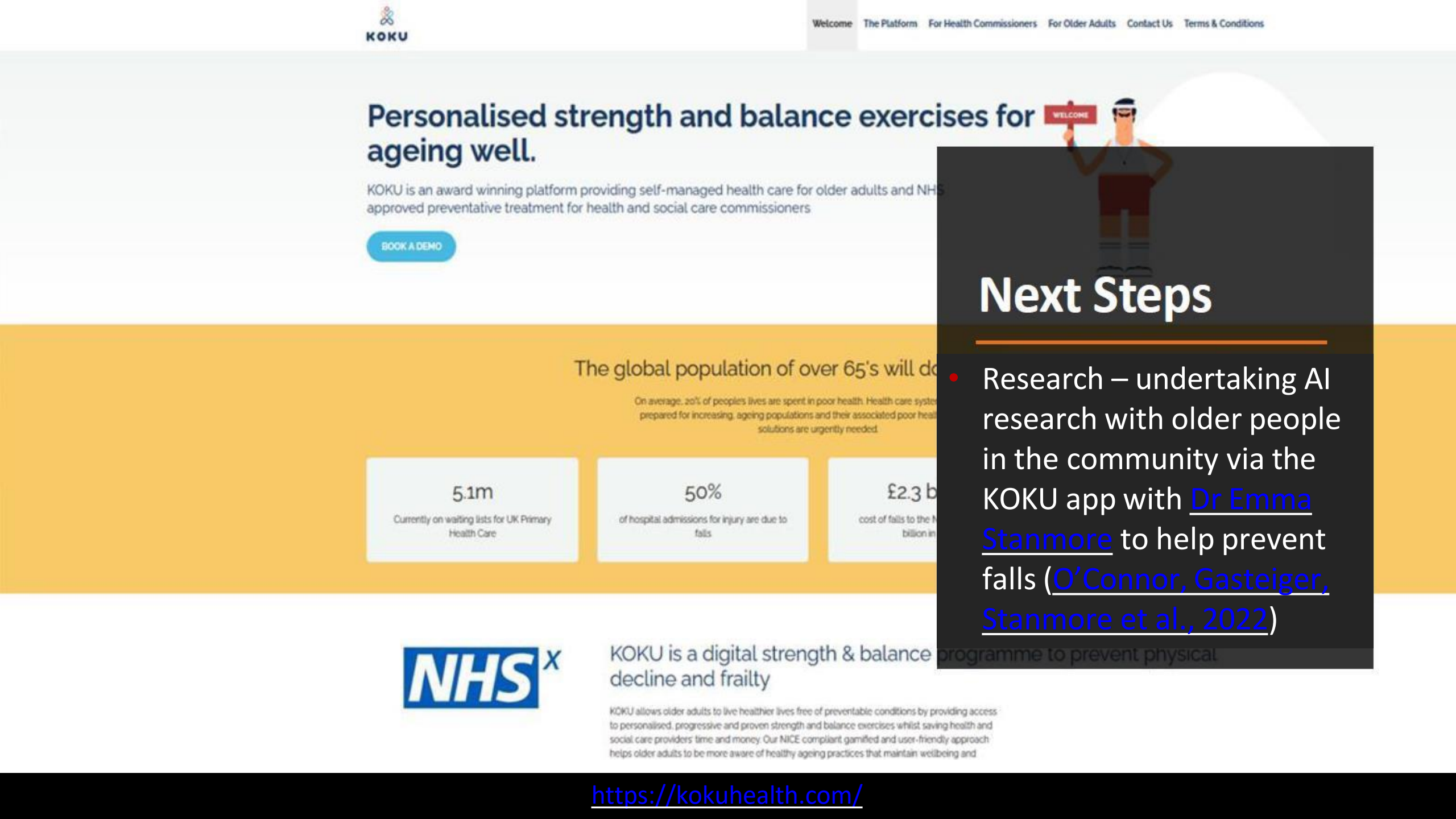

Next Steps

- Research – undertaking AI research with older people in the community via the KOKU app with Dr Emma Stanmore to help prevent falls (O'Connor, Gasteiger, Stanmore et al., 2022)

https://kokuhealth.com/

Next Steps

- Policy – Philips Ives Review on digital transformation in nursing and midwifery in NHS England
- Led by Natasha Philips, Chief Nursing Informatics Officer for NHS England
- Expert on the AI and data science panel

The Phillips Ives Nursing & Midwifery Review

The Phillips Ives Review will provide evidence and inform strategy; ensuring that nurses and midwives are given access to the knowledge, skills and education required for safe, effective digitally-enabled practice.

About The Phillips Ives Review

How will The Phillips Ives Review be conducted

How we've engaged throughout the Review

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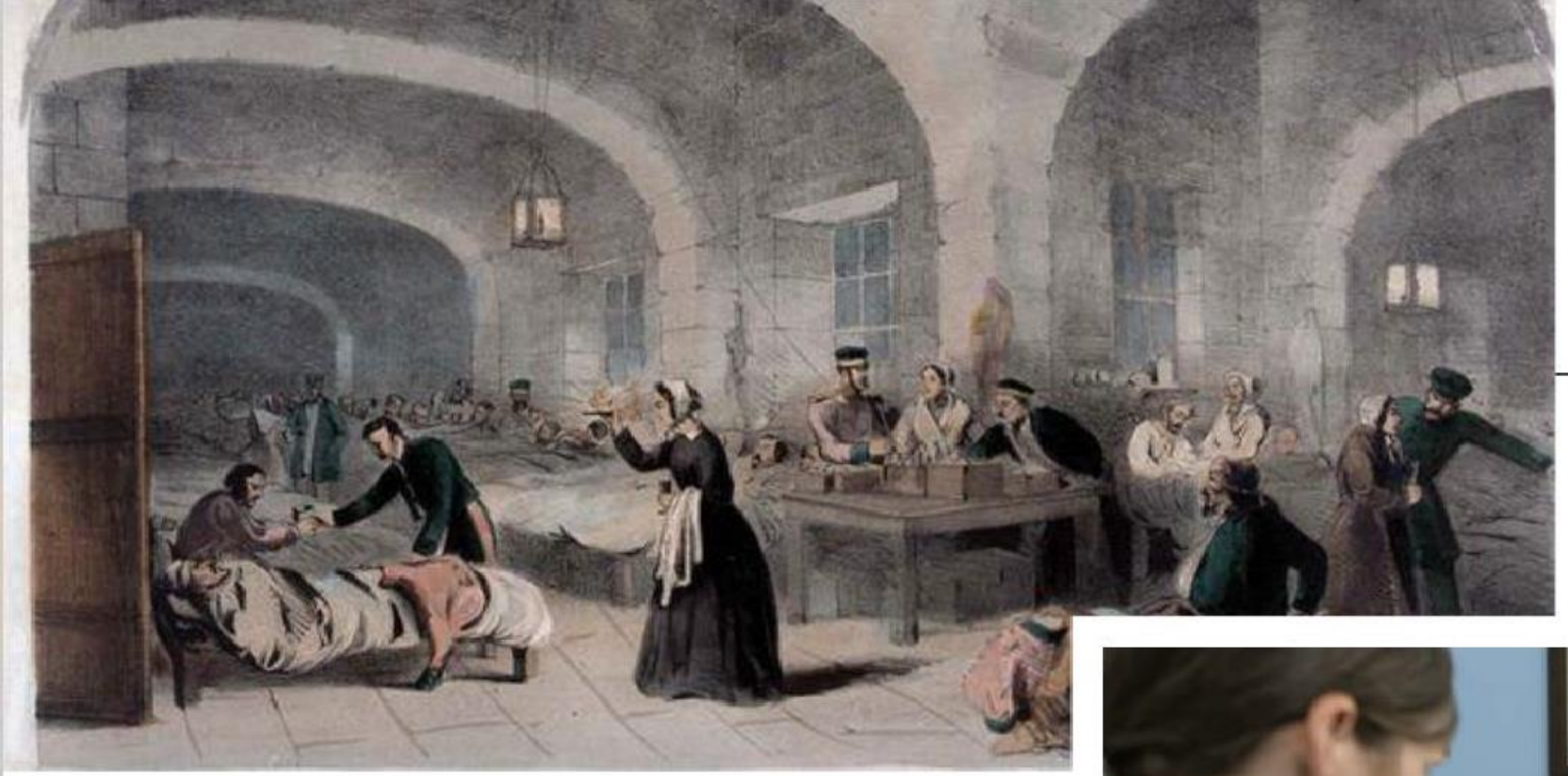

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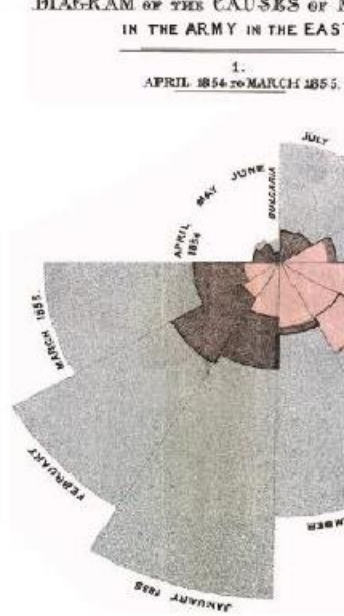
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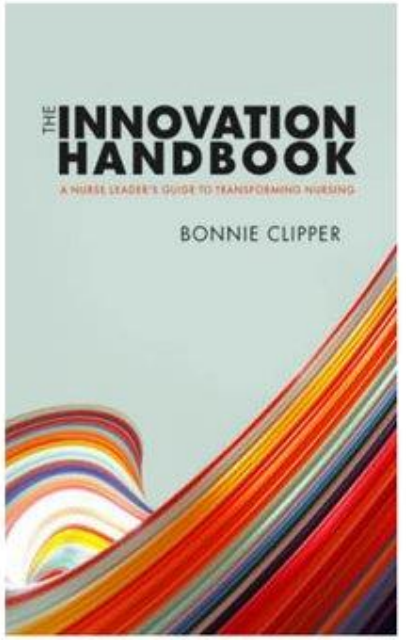

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