**AI-Based Assistive Technology for the Physically Disabled and the Elderly: Opportunities, Challenges, and Ethical Implications**

**Slide 1: Title Slide**

* Title of the Review

**Slide 2: Introduction**

* Growing demand for assistive technologies (AT)
* Rise of AI in supporting independence and care
* Purpose: Evaluate benefits, limitations, ethics, and adoption of AI-based AT

**Slide 3: Research Aims and Questions**

* Impact of AI on elderly and disabled populations
* Ethical and design challenges of AI-based AT
* Barriers and enablers to adoption

**Slide 4: Background and Context**

* Shift in demographics: Ageing population
* Overview of AI integration in assistive tools
* Human-Centered Design (HCD) and socio-technical frameworks

**Slide 5: Methodology and Source Selection**

* Databases used: PubMed, IEEE Xplore, Scopus, Google Scholar
* Keywords: “AI and assistive technology”, “AI in senior care”, etc.
* Peer-reviewed journals, case studies, and grey literature (2015–2025)

**Slide 6: Overview of AI-Based Assistive Technologies**

* Categories: Mobility aids, communication tools, environmental control systems
* Example technologies: autonomous wheelchairs, voice assistants, smart home controls
* Integration of computer vision and NLP

**Slide 7: Use Cases in Vision and Hearing Assistance**

* Wearable vision-language models (Baig et al., 2024)
* Real-time object recognition
* Sign language translation using computer vision

**Slide 8: AI for Health and Safety Monitoring**

* Fall detection and health surveillance systems
* Example: Real-time alerts for older adults (Bint Khalid et al., 2024)
* Predictive care through pattern analysis

**Slide 9: Needs of Target Populations**

* Functional needs: Intuitiveness, reliability, adaptability
* Importance of co-design and inclusivity (Kirongo et al., 2022)
* Differences between elderly and disabled users

**Slide 10: Benefits and Innovations**

* Increased independence, personalized care
* Smart adaptations to user behavior
* Emotional and cognitive support (Ran et al., 2022; Bastola et al., 2025)

**Slide 11: Ethical Considerations**

* Data privacy and informed consent (Zdravkova, 2022)
* Bias in AI algorithms (Das, 2025)
* Transparency and explainability challenges

**Slide 12: Barriers to Adoption**

* High cost of development and maintenance
* Lack of digital literacy among users and caregivers
* Infrastructure limitations and lack of training

**Slide 13: Policy and Regulation Gaps**

* Lack of universal standards for AT
* Accessibility and compliance issues
* Need for equitable and inclusive AI governance

**Slide 14: Critical Evaluation and Synthesis**

* Literature supports AI potential but reveals uneven implementation
* Research bias towards developed regions
* Mental health effects and loss of human interaction still underexplored

**Slide 15: Conclusion**

* Summary: AI-based AT is promising but complex
* Must prioritise ethical design, affordability, and user inclusion
* Cross-sector collaboration and research needed

**Slide 16: Recommendations and Future Directions**

* Design for inclusivity and cultural adaptability
* Prioritise cost-effective solutions
* Encourage co-design with end-users
* Involve interdisciplinary experts: medicine, policy, engineering