Original Article

Comparing ChatGPT and Google Bard: Assessing AI-Powered Information Retrieval in Nursing

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Abstract

Introduction

In healthcare, rapid access to accurate information is essential, especially for nurses who make critical decisions. Artificial intelligence (AI) offers promise in this context, with ChatGPT and Google Bard being notable AI-driven information retrieval tools.

Methods

This study evaluated ChatGPT and Google Bard's performance by assessing their responses to 50 diverse medical knowledge questions, covering infection control, vital signs, CPR, and more, and comparing their response to the correct answers.

Results

ChatGPT achieved a 64% accuracy rate, while Google Bard achieved 56%. Both models agreed on key medical concepts, but disagreements emerged in some areas, highlighting disparities in their responses. Nurses' expertise in patient-centered care, clinical judgment, and communication complements AI. AI aids in providing evidence-based information but cannot replace nurses' human touch and critical thinking. Integrating AI into nursing education enhances learning and prepares professionals for evolving healthcare landscapes.

Conclusion

ChatGPT and Google Bard have strengths and weaknesses, making them valuable aids but not substitutes for nurses. Ethical considerations are vital as AI continues to shape healthcare. Nurses must ensure ethical AI use while upholding their commitment to compassionate care.

1. Introduction

In the healthcare world, having access to accurate and fast information is incredibly important. Nurses, who play a vital role in patient care, frequently encounter diverse medical situations that demand quick and precise decision-making [1–3]. As medical knowledge and technology continue to evolve rapidly, nurses must have reliable sources of information at their fingertips to provide high-quality care and make well-informed clinical judgments [4,5]. In recent times, artificial intelligence (AI) has emerged as a potential solution to assist healthcare

professionals in promptly accessing and retrieving essential medical information [4,6,7].

One noteworthy AI development in the realm of information retrieval and natural language understanding is ChatGPT, a language model developed by OpenAI. ChatGPT is designed to comprehend and generate human-like text based on the questions it receives. This AI tool has shown promise in various applications, including answering medical queries [6]. It could become a valuable resource for nurses seeking immediate answers to their clinical questions [4,8].

On the other hand, Google Bard, developed by Google, has also entered the AI-powered information retrieval arena. Google Bard aims to provide users with accurate and contextually relevant information by tapping into Google's extensive knowledge database and utilizing advanced natural language processing capabilities [9].

AI plays a vital role in various facets of human existence due to its proficiency in producing coherent and contextually appropriate text, derived from its training on extensive datasets [10,11]. Given the potential significance of AI-driven tools in healthcare, it is critical to assess their effectiveness and accuracy, particularly in specialized areas like nursing [2,8,9]. While both ChatGPT and Google Bard offer the promise of facilitating information retrieval for nurses, it is essential to determine which tool performs more effectively in providing accurate nursing-related information.

Thus, the purpose of this study is to investigate how well ChatGPT and Google Bard answer nursing-related questions correctly. By comparing these two AI models, we aim to understand how good they are at giving accurate and relevant information when nurses need it. Our research will shed light on the strengths and weaknesses of AI-driven information retrieval tools in healthcare and may guide their use in real-world nursing practice.

2. Methods

In this study, we used a set of 50 questions related various medical parameters across different sections to evaluate the performance and consistency of both ChatGPT and Bard in responding to these diverse medical knowledge questions. The questions covered topics related to infection control, sterile technique, sutures, wound closure, vital signs, body temperature, CPR, and miscellaneous medical knowledge. When searching for the relevant literature regarding our study, papers from only legitimate journals were considered, those published in predatory journals were excluded according to Kscien's list [12].

3. Results

In a comparative assessment between ChatGPT and Google Bard, it was noted that ChatGPT successfully provided 32 accurate responses out of 50 questions, achieving a commendable 64% accuracy rate. In contrast, Google Bard managed to answer 28 questions correctly out of 50, resulting in a 56% accuracy rate.

Both ChatGPT and Google Bard demonstrated a high degree of agreement on several key medical knowledge points. They concurred on essential concepts, such as the most common cause of wound infection (*Staphylococcus Aureus*), principles of skin disinfection, appropriate suture materials (PDS - Polydioxanone), and core temperature measurement methods (rectal). Additionally, they aligned on topics like maximal heart rate during exercise, apical pulse location, normal respiratory rates in newborns, factors influencing pulse rate, and essential components of effective CPR.

The Povidone Iodine Solution discussion illustrates a disagreement between ChatGPT and Google Bard, where ChatGPT opposed the notion that the effects last up to 3 hours, while Google Bard supported it. The accurate information is that Povidone iodine solution remains effective for up to 8 hours. Similarly, in the Skin Disinfection section, both AI models disagreed with all options, despite the correct statement being that Povidone iodine exhibits potent bactericidal activity against both gram-positive and gram-negative bacteria, aligning with option 'a.' The Sterile Gloving Technique and Setting Up Sterile Field sections demonstrate various disagreements between ChatGPT and Google Bard, indicating disparities in their responses. Regarding Body Temperature, both AI models concurred that pregnancy may lead to decreased body temperature, which is inaccurate; typically, pregnancy results in a slight increase in body temperature due to hormonal changes. All questions with their corresponding answers were added in (Table 1).

4. Discussion

Nurses hold a vital role in healthcare, leveraging their distinctive skills and expertise to deliver patient-centric care [1,3]. While AI tools such as ChatGPT Bard can augment patient care and clinical decision-making, they are incapable of substituting for the invaluable contributions of nurses [13,14]. Nurses excel in various aspects that complement AI capabilities: firstly, they champion patient-centered care, tailoring treatment plans to individual needs while AI aids by offering evidence-based information [15]. Secondly, nurses apply clinical judgment, relying on their deep medical knowledge to assess patients and make informed decisions, with AI providing valuable prompts for enhanced decision-making [4,7,8]. Thirdly, nurses possess strong communication skills, establishing rapport and facilitating information exchange; AI can assist through chatbots answering patient queries [13]. However, significant contrasts exist as well: nurses provide a human touch, offering emotional support and trust-building that AI cannot replicate [16–18]. They also exercise critical thinking to navigate complex situations, a skill beyond AI's reach [17]. Finally, nurses advocate for their patients, ensuring their rights and needs are met, a role that AI cannot fulfill [17,19].

When comparing the performance of ChatGPT and Bard with nurses' responses and correct answers, there are strengths and weaknesses on both sides. ChatGPT and Bard exhibited notable

Table 1: Comparison of Responses between ChatGPT and Google Bard in Nursing Knowledge Questions

Questions	ChatGPT	Google Bard	Correct Answer	Agreements	
				ChatGPT	Google Bard
Which of the following organisms is the most common cause of wound infection? A. *Staphylococcus epidermidis* B. Yeast C. *Streptococcus viridians* D. *Staphylococcus Aureus* E. Candida albicans	D	D	D	Agree	Agree
Povidone iodine solution: A. Effects last up to 1 hr. B. Effects last up to 3 hrs. C. Effects last up to 8 hrs. D. Effects last up to 12 hrs. E. Effects last up to 1 day.	C	B	B	Disagree	Agree
Which of the following is TRUE regarding skin disinfection? A. Povidone iodine provides good bactericidal activity against both gram-positive and negative bacteria. B. Chlorhexidine provides good bactericidal activity against gram-positive bacteria but is less effective against gram-negative. C. The use of iodine solutions is proving to be superior to chlorhexidine. D. Chlorhexidine causes more irritation to the skin compared to iodine solution. E. None of the above	B	A	E	Disagree	Disagree
The correct method for application of disinfectant to the skin: A. A circular motion beginning with the central area of the procedure and working outward toward the periphery of the sterile field. B. A circular motion beginning with the peripheral area of the sterile field and moving toward the central area of the procedure. C. A zigzag motion from up to down. D. A transverse motion from right to left. E. A longitudinal motion.	A	B	A	Agree	Disagree
When removing the mask after an aseptic procedure, what should the nurse do first? A. Untie the bottom strings of the mask. B. Untie the top strings of the mask. C. Remove gloves. D. Untie the top strings and let the mask hang. E. Wash your hands	E	C	C	Disagree	Agree
An appropriate principle of sterile technique is that: A. The entirety of a sterile package is sterile once it is opened. B. All of the draped table, top to bottom, is considered sterile. C. An object held below the waist is considered contaminated. D. If the sterile barrier field becomes wet, the dry areas are still sterile. E. All of them	C	C	C	Agree	Agree
Which of the following is an appropriate technique for the nurse to use when performing sterile gloving? A. Put the glove on the nondominant hand first. B. Pull the cuffs down on both gloves after gloving. C. Grasp the outside cuff of the other glove with the gloved hand. D. Grasp the outside of the glove with bare hands. E. Interlock the hands after both gloves are applied.	D	A	E	Disagree	Disagree
A nurse is preparing a sterile field for an emergency thoracostomy using a surgical aseptic technique. The nurse gathers supplies to prepare the sterile field using a packaged drape. Which option correctly describes how the nurse should set up the field? A. Avoid dropping sterile supplies close to the 1-inch border around the drape. B. Don sterile gloves before opening the packaged drape. C. Clean the bottle of irrigation solution with alcohol before placing the bottle on the field. D. Leave the sterile field unattended to obtain needed supplies. E. Put the closed package on the sterile field.	E	A	A	Disagree	Agree
Which of the following is the appropriate sequence to use when applying the sterile technique? A. Wash hands, secure hair, apply hair cover, apply sterile gloves, and don protective eyewear. B. Wash hands, secure hair, apply hair cover, don protective eyewear, and apply sterile gloves. C. Secure hair, apply hair cover, Wash hands, don protective eyewear, and apply sterile gloves.	C	B	B	Disagree	Agree

Table 1: Continued...

D. Secure hair, don protective eyewear, apply hair cover, wash hands, and apply sterile gloves. E. None of the above.					
Surgical asepsis is defined as: A. Absence of all virulent microorganisms. B. Absence of all microorganisms. C. Slowed growth of microorganisms. D. Use of handwashing, gowning, and gloving. E. None of the above.	A	B	B	Disagree	Agree
Which of the following steps during the removal of a surgical gown is NOT correct? A. Untie the neck strings of the gown with the help of an assistant. B. Pull on both shoulders of the gown to break the neck strings. C. Take off the gown by turning it inside out as it is removed. D. Roll up the gown with the contaminated surface facing inward and away from you. E. Roll up the gown with the contaminated surface facing outward and away from you.	E	E	E	Agree	Agree
Absorbable suture: A. Maintain their tensile stress for a long duration. B. Plain gut and chromic gut have good knot security. C. Sutures placed in mucous membranes absorb slower than those placed in muscle tissue. D. Vicryl is a tissue irritant and can cause a substantial tissue reaction. E. Absorbable sutures placed in mucous membranes absorb faster than those placed in fascia.	C	C	E	Disagree	Disagree
Which of the following statements about natural and synthetic absorbable sutures is TRUE? A. Synthetic absorbable sutures degrade more slowly than natural absorbable sutures. B. Natural absorbable sutures maintain tensile strength for a longer duration than synthetic absorbable sutures. C. Synthetic absorbable sutures cause more irritation to the skin than natural absorbable sutures. D. Synthetic absorbable sutures have better knot security than natural absorbable sutures. E. None of them.	A	E	D	Disagree	Disagree
Nylon: A. It is a polyfilament suture. B. Has good tensile strength C. Has a high tissue reactivity? D. Easy to handle and tie. E. It tends to harbor bacteria.	B	B	B	Agree	Agree
The choice of suture technique depends on the following EXCEPT: A. Type and anatomic location of the wound B. Thickness of the skin C. Degree of tension D. Desired cosmetic result E. None of them	E	E	E	Agree	Agree
A continuous suture is placed beneath the epithelial layer of the skin in short lateral stitches; it leaves a minimal scar. These are placed just below the layer of the skin; A. Subcuticular suture B. Interrupted suture C. Horizontal mattress suture D. Interlocking suture E. Continuous suture	A	A	A	Agree	Agree
Which of the following statements best describes PDS (Polydioxanone) suture material? A. monofilament, non-absorbable, synthetic B. monofilament, absorbable, synthetic C. multifilament, non-absorbable, natural D. multifilament, absorbable, synthetic E. monofilament, absorbable, natural	B	B	B	Agree	Agree

Table 1: Continued...

Which of the following suture techniques is useful for those away from their primary source of medical care? A. Interlocking Slip Knot B. Simple interrupted suture C. Simple Running Stitch D. Running Locked Closure E. Locked Vertical Mattress Stitch	C	B	A	Disagree	Disagree
The wound is closed by a nurse using a simple running technique. The nurse should be informed of the technique's disadvantages; A. Takes too much time for closure. B. Cannot be used to achieve hemostasis. C. Can be used for wounds under tension. D. Can be associated with significant epithelialization of the suture track. E. All of them	D	A	D	Agree	Disagree
Which of the following is a good wound closure technique for wounds with inadequate circulation to the wound edges? A. Vertical mattress stitch B. Locked vertical mattress stitch C. Continuous Single¬ Locked Stitch D. Horizontal Mattress Stitch E. Half Buried Horizontal Mattress Stitch	B	E	D	Disagree	Disagree
Which of the following is CORRECT about the Hair apposition technique? A. It is a painful technique. B. Requires the application of anesthesia. C. Takes a longer procedure time. D. The technique of choice for wounds under tension E. None of them	E	E	E	Agree	Agree
Which of the following closure techniques is best for a small, tidy wound on the face? A. Skin closure tapes B. Continuous (Running) Horizontal Mattress Stitch. C. Locked vertical mattress stitch. D. Subcuticular suture E. Interrupted suture	A	D	A	Agree	Disagree
Where is temperature regulated? A. Hypothalamus B. Brain stem C. Thalamus D. Hippocamps E. Pineal gland	A	A	A	Agree	Agree
Which of the following processes will eliminate the highest amount of our bodies' heat? A. Radiation B. Convection C. Conduction D. Evaporation E. None of them	D	D	A	Disagree	Disagree
Which of the following statements is NOT true regarding body temperature? A. Body temperature is lower in the morning. B. Infants and children normally have a higher body temperature than adults. C. Women may experience a slight increase in body temperature at the sometime of menstrual cycle. D. Pregnancy may cause the body temperature to decrease. E. Aspirin may lower the normal temperature.	D	D	D	Agree	Agree
................elevated body temperature that remains high throughout the day, fluctuating more than 2 degrees Fahrenheit. A. Intermittent fever B. Remittent fever C. Continuous fever D. Undulating fever E. Relapsing fever	B	C	B	Agree	Disagree

Table 1: Continued...

Question					
Which of the following areas of the body measure the body's core temperature and are considered the most accurate? A. Oral B. Axillary C. Tympanic D. Temporal artery E. Rectal	E	E	A	Disagree	Disagree
What is a 40-year-old man's maximal heart rate during exercise? A. 100 B. 120 C. 140 D. 160 E. 180	E	E	E	Agree	Agree
Which of the following variables influencing pulse rate is NOT true? A. Activity increases pulse rate. B. As age increases, pulse rate increases. C. Female pulse rate is higher than males. D. Athletes have lower pulse rates. E. Depression may lower the pulse rate.	B	C	B	Agree	Disagree
The apical pulse located in the....... A. Right of the sternum, 4th or 5th intercostal space below the nipple. B. Right of the sternum, 4th or 5th intercostal space in the posterior axillary line. C. Left of the sternum, 1st or 2nd intercostal space above the nipple. D. Left of sternum, 4th or 5th intercostal space below the nipple. E. Left of sternum, 4th or 5th intercostal space in the posterior axillary line.	D	D	D	Agree	Agree
What is the name of the artery palpated on top of foot, slightly lateral to the big toe? A. Popliteal artery B. Dorsalis pedis artery C. Anterior tibial artery D. Posterior tibial artery E. Arcuate artery of foot	B	B	B	Agree	Agree
Normal respiratory rate in a newborn is.... A. 30-50 B. 20-30 C. 12-20 D. 50-70 E. 15-25	A	B	A	Agree	Disagree
A shrill, harsh sound heard more clearly during inspiration, but can occur during expiration. This sound may occur when there is airway blockage: A. Stertor B. Wheeze C. Stridor D. Fine crepitation E. Coarse crepitation	C	C	C	Agree	Agree
Rhonchi can be heard in all of the following condition Except? A. Pneumonia B. Congestive heart failure C. Cystic fibrosis D. COPD E. Asthma	C	E	B	Disagree	Disagree
A pulse is described as regular or irregular by its: A. Rate B. Character C. Volume D. Rhythm E. Consistency	D	D	D	Agree	Agree
The pulse site used while taking blood pressure is: A. Carotid B. Subclavian C. Axillary D. Brachial E. Radial	D	E	D	Agree	Disagree

Table 1: Continued...

Which of the followings factor may result in decrease of blood pressure? A. Massive heart block B. Fear C. Renal disease D. Nicotine E. Pain	A	A	A	Agree	Agree
Essential hypertension: A. Slow-onset elevated blood pressure without symptoms. B. Primary hypertension of unknown cause. It may be genetically determined. C. Rapidly developing elevated blood pressure that may become fatal if not treated immediately. D. Hypertension with systemic symptoms E. None of them	B	B	B	Agree	Agree
The term used to describe difficult or labored breathing is A. Apnea B. Tachypnea C. Bradypnea D. Platypnea E. Dyspnea	E	E	E	Agree	Agree
During CPR after an advanced airway is in place, which of the followings is true: A. The breaths should be synchronized with the chest compressions. B. The goal is 20 or greater breaths per minute. C. Chest compressions should be stopped while giving breaths. D. One breath every 6 seconds should be given E. Continues the CPR with 30/2	E	A	D	Disagree	Disagree
What is the single most important therapy for survival of cardiac arrest? A. Early pharmacological treatment B. Early differential diagnosis C. Early defibrillation D. Early cardioversion E. Early rescue breathing	C	C	C	Agree	Agree
When performing two-rescuer CPR, how often should you switch roles? A. After every cycle of CPR. B. After every 3 cycles of CPR C. After every five cycles of CPR D. After every 10 cycles of CPR E. The first should continue chest compression, and the second act as a rescuer.	B	B	C	Disagree	Disagree
What are the essential components of effective CPR? A. Starting chest compression within 10 seconds of recognition of cardiac arrest. B. Pushing hard and fast. C. Minimizing interruption. D. Between each compression, completely stop pressing on the chest. E. All of them	E	E	E	Agree	Agree
You just performed 5 cycles of CPR on an adult. You reassess for a pulse. No pulse is present. What is your next course of action? A. Call for help B. Attach the AED C. Immediately reinitiate CPR. D. Try advanced airway. E. Use IV drug	B	C	C	Disagree	Disagree
Which of these answers appropriately describes how to perform chest compressions on an adult? A. Palms placed midline on the lower 1/3 of the sternum. B. Palms placed on the left lower 1/3 of the sternum. C. Palms placed on the right lower 1/3 of the sternum. D. Palms placed in the center of the sternum above the nipples, using both arms.	D	D	A	Disagree	Disagree

Table 1: Continued...

E. Compression should be slow to allow full recoil.					

Which of the following is performed before the BLS Assessment? A. Call the patient for a response. B. Check the pulse. C. Look and feel breathing. D. Call 911 E. Make sure the scene is safe	E	E	E	Agree	Agree
Which of the following is NOT advanced airway equipment? A. Oropharyngeal airway B. Endotracheal tube C. Laryngeal mask D. Laryngeal tube E. None of them	A	A	A	Agree	Agree
When using a monophasic defibrillator, the initial energy level should be: A. 100 J B. 150 J C. 200 J D. 260 J E. 360 J	E	A	E	Agree	Disagree
Which of the following is NOT true regarding amiodarone? A. Need continuous cardiac monitoring. B. Very long half-life (up to 40 days). C. Used for 2nd and 3rd degree heart block D. Do not administer via the ET tube route. E. Used in VF and pulseless VT.	C	D	C	Agree	Disagree
A person with alcoholism collapses and is found to be in Torsade's de Pointes. What intervention is most likely to correct the underlying problem? A. Rewarm the individual to correct hypothermia. B. Administer magnesium sulfate 1 to 2 gm IV diluted in 10 mL D5W to correct low magnesium. C. Administer glucose to correct hypoglycemia. D. Administer naloxone to correct narcotic overdose. E. None of them	B	B	B	Agree	Agree

strengths in various aspects: firstly, ChatGPT outperformed Bard in a text-based radiology knowledge assessment by providing notably more accurate responses [20]. Moreover, in the evaluation of generating medical responses, ChatGPT excelled in furnishing precise information across diverse medical queries, as assessed by academic physician specialists. Additionally, in the context of the Japanese National Nurse Examinations, ChatGPT achieved a commendable success rate in providing accurate answers to a significant number of questions [21].

Ongoing education and training are vital for nurses to stay up-to-date with medical advancements and AI technologies [22,23]. Integrating AI into nursing education offers several benefits, including improved learning outcomes, personalized learning experiences, simulation-based training, clinical decision support, extended reality for real-world experience, and the convenience of AI-powered chatbots for accessing information and honing clinical skills [13,14,22]. These AI-driven enhancements prepare future healthcare professionals to thrive in a rapidly evolving healthcare landscape [15].

plans, efficient medical record management, and the provision of patient information through chatbots. Nurses, with their unique skills in patient-centered care, critical thinking, and emotional support, can work alongside AI to improve patient care and outcomes [25]. However, ethical considerations arise as AI becomes more integrated, necessitating alignment with patient values and privacy while maintaining a compassionate approach [15]. Nurses share the responsibility of influencing AI integration in healthcare systems to ensure ethical practices and uphold core nursing values, such as compassionate care [13].

Ethics in AI healthcare use are crucial for respecting patient privacy, informed consent, and healthcare professionals' responsibility [26,27]. Key findings include the need for clear, informed consent, safeguarding patient data privacy, addressing bias and discrimination, and maintaining physician autonomy when utilizing AI [26]. Healthcare professionals must ensure ethical AI use, validate AI-generated data, and align it with patient values [27]. Future research should focus on developing ethical guidelines. Nurses must adapt by integrating AI into their education to provide top-quality patient care while upholding ethical standards [24,26,27].

5. Conclusion

This study compared ChatGPT and Google Bard in providing nursing information. Both showed strengths and weaknesses, with ChatGPT achieving a 64% accuracy rate and Google Bard at 56%. While AI aids nurses, their core skills in patient care, clinical judgment, and advocacy remain irreplaceable. Integrating AI into nursing education can enhance learning, and ethical considerations are vital as AI continues to shape healthcare. Nurses must ensure ethical AI use while upholding their commitment to compassionate care.

Declarations

Conflicts of interest: The author(s) have no conflicts of interest to disclose.

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