**Discussion4:**

**Datasets and Database**

**Post a response explaining the differences between datasets and databases. Explain how you might use each type of data in your professional practice. Be specific and provide examples.**

According to USGS.gov, the dataset is a collection of structured data that is associated with a unique body of work stored. On the other hand, there is an organized collection of data stored in datasets and accessed electronically from a computer system so that it can be easily accessed, manipulated, and updated called a database.

**Datasets:**  A wide range of information such as text, images, audio recordings, or numerical values are included in datasets and can be stored in various formats like a spreadsheet or a database. Data can be organized in various ways such as a set of observations in a statistical analysis or as rows and columns in a table. This can be extracted from multiple sources such as existing databases, from a survey, or via an experiment and can be used in training or machine learning models. This can be used to reproduce or validate research results and can be shared privately or publicly. (Database Town, 2023)

**Database:** From storing information for an e-commerce website to tracking inventory for a retail company or recording results of scientific experiments, Databases are used in a wide range of applications. They are managed by database management system such as MYSQL, SQLite, Oracle, SQL Server, and more which provides a way to interact with the data stored in a database. There are different types of databases suited for different types of applications such as a Relational database for storing structured data in tables with predefined schemas and a document database for storing unstructured data such as JSON documents. (Database Town, 2023)

Both Datasets and Database are used in my professional practice. Nurses are one of the crucial and largest groups of healthcare professionals, they always focus on quality and safety and make sure there are best patient outcomes. For this nurse need to access data about their patient and the impact of their care and they need to know how to interpret data.

We used Electronic Health Records (EHR) datasets in my workplace that include all the patient information, such as patient health history, demographic vitals, diagnosis, medication, lab results, outcomes, and many more. To collect and store patient information EHR is used in many healthcare systems including ours. A variety of medical information from individual patient overtime is captured to manage clinical workflows. We use EHR for different purposes such as facilitating patient identification, documenting vital signs, patient demographics, assessments, and providing medications. We also access EHR to get information about patient diagnostics, results, and procedure information that was documented by other healthcare personnel in the hospital. I agree with Kimberly S. Glassman, that EHRs have helped nurses understand how to care for populations of patients, and for that information about individual patients is extracted and compiled into flow sheet rows. Vital signs and other physiologic measurements lend themselves nicely to flow sheet input.

Every piece of information clinical personnel collects for a patient including medications, prescriptions procedures, encounter, and discharge is logged in a healthcare database that helps individual understand their place and activity in a large healthcare industry enabling clinical personnel to make decisions. According to Dnsstuff.com, Through healthcare databases we are able to exchange information for instance I work in a stroke unit and when our physician accepts a stroke patient from another facility who needs a thrombectomy, instead of Patient coming here and doing another CT scan our physician requests imaging from that facility and that sharing of patient information is done via database so that the treatment won't be delayed for that patient.

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**Response1:**

Hi Dr Moyers,

Thank you for the question

We are constantly looking for new medical applications, that would help improve services and these can be done via databases, that store data regarding diseases, diagnosis, treatments, medication, medical devices, medical practices, and other pertinent details about medical professionals. This constant technological advancement has also made databases to be complex and technologically advanced.

Databases can assist the health care professional in diagnosis and treatment of a patient. They play a vital role in providing accurate, timely and comprehensive health care services to patients by helping to detect and prevent many diseases and improving quality of life. Physicians performs variety of task such as screening patients, managing illnesses, performing surgeries, and administering drugs. Several health care databases are used in managing these tasks depending on the location for instance, critical care databases used in critical care for careful and accurate analysis. Emergency health care databases are used for emergency room staff.

Different databases in different places perform different functions but they also share one crucial functionality and that is real time alerting that helps in diagnosis and treatment. Wearable devices will collect patient health data 24/7 and send it to the cloud, this information will then be accessed to the database on the state of health of the public, which will allow doctors to compare this data in a socio-economic context and modify the delivery strategies accordingly. Health care organizations will use this tool to monitor this massive data stream and react every time the results are disturbing. For example, if a patient’s blood pressure increases alarmingly, the system will send a live alert to the doctor, who will then take action to reach the patient and administer measures to lower the pressure. (Calzon, 2023)

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**Response2:**

Hello, Dr Moyers,

Data mining is the process of extracting potentially useful information and knowledge hidden in a large amount of incomplete, noisy, fuzzy, and random practical application data. (Wu et al., 2021) Through data mining high quality medical data can be made available in the form of public databases for researchers and the generated result can further guide clinical practice.

The purpose of data mining is to recognize the pattern and relationships in attributes of the clinical setting and to estimate the outcome, to support clinicians when making decisions. It also aims to promote patient safety and clinical decision making.

It can assist Nurse informatics specialist as Decision-making, problem-solving, analysis, planning, diagnosis, identification, integration, prevention, learning, and therapy development are all possible using Data Mining. (Anand, 2022). Clinical decision support system is being used more frequently in hospitals these days making decision based on knowledge and rules to generate conclusion that are based on data mining and data analysis.

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