COLLECTING ELECTRONIC HEALTH RECORD (EHR) TO SUPPORT HOLISTIC SPA THERAPY AS A DIAGNOSTIC PROCEDURE FOR ADVANCE CARE PLANNING (ACP): A LITERATURE REVIEW

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Abstract

Developing technology and collecting electronic information are fostering the creation of new procedures and clinical decision-support tools for therapy in rehabilitation hospitals and spa resorts. Electronic health records (EHR) does not take into account the complementarity of activities with the need for effective patient care in rehabilitation and sanatorium hospitals and spas. This paper aims to present a proposal for a complementary electronic anamnestic tool (CEAT) in a holistic approach to the patient's prevention and rehabilitation process in a rehabilitation hospital or a spa resort using EHRs that will be effective in ACP. To achieve the objective thus formulated, the literature was reviewed and thoroughly analyzed in terms of stratification and classification of the tools using EHRs. designed CEAT tool consists of a history of physical status (weight, height, waist circumference), neurological incidents, cardiovascular disorders, past treatments/surgeries, psychiatric disorders, and level of daily physical activity, supplemented by survey questionnaires selected in a literature review based on their widespread usefulness supported by scientific evidence. The questionnaires included in CEAT allow for a multifaceted assessment of the patient's health status, taking into account their physical state, functional capacity, and well-being.

1 INTRODUCTION

Developing technology and collecting electronic information are fostering the creation of new procedures and clinical decision-support tools for therapy in rehabilitation hospitals and spa resorts. Increased collection of patient data in healthcare institutions opens up new opportunities to apply this information to improve treatment outcomes (Gunn et al. 2023). Furthermore, it seems that such activities can be educational for spa patients by raising their awareness of the cause-and-effect relationships for healthy living. From the perspective of the effectiveness of the treatment, this is equally important in terms of the holistic approach to this process in rehabilitation and prevention. At the same time, there is a perceived lack of

advance care planning (ACP) implemented to support the patient. Collecting electronic health records (EHR) can be a way of eliminating the barriers associated with the lack of ACP, which can significantly affect the quality of medical services and the adaptation of treatment forms and methods, thereby supporting the patient in the healing process (Huber et al. 2018). Lamas et al. (2018) indicate that EHR has the potential to capture patient knowledge. This action allows the subject examination to be extended to include anamnestic patient data. As suggested by Lamas et al. (2018), however, this requires improved levels of security and system performance, as well as regular monitoring and documentation.

To the best of our knowledge, although EHRs are increasingly popular in many

healthcare settings, this procedure does not take into account the complementarity of activities with the need for effective patient care in rehabilitation and sanatorium hospitals and spas. Such activities are interim and often target specific needs of the medical facility, such as collecting statistical data on the prevalence, age of patients, and demand for specialist doctors, which is undoubtedly important for adapting the management plan in medical facilities.

The patient's ACP needs using EHRs could be met by using an electronic tool built from complementary and compatible survey questionnaires, providing holistic information about the patient and whose effectiveness is based on scientific evidence. Building such a tool requires the verification of scientific evidence assessing the patient in a multifaceted manner, which will potentially allow the anamnestic study to be broadened. In this way, the knowledge collected can support the doctor qualifying the patient in the sanatorium. It allows him or her to identify the patient's needs and accurately diagnose and classify them into appropriate methods and forms of therapeutic interventions.

2 OBJECTIVE

This paper aims to present a proposal for a complementary electronic anamnestic tool (CEAT) in a holistic approach to the patient's prevention and rehabilitation process in a rehabilitation hospital or a spa resort using EHRs that will be effective in ACP. It was assumed that only validated survey questionnaires, supported by scientific evidence collected during direct patient interventions, could be included in the developed complementary electronic anamnestic tool with advance care planning. To achieve the objective thus formulated, the literature was reviewed and thoroughly analysed in terms of stratification and classification of the tools using EHRs.

3 METHODOLOGY

A data mining approach was used. A selective literature review using platforms such as Ebsco Information Services, PubMed, and Google Scholar was conducted. The selection of keywords was made by a panel of experts consisting of the scientific research team at the Jerzy Kukuczka Academy of Physical Education in Katowice (field of medical and health sciences) and the medical staff of the Accessmedica Rehabilitation Centre in Olsztyn, Poland (nurses, physiotherapists, doctors, and management staff). The assumption was that the keywords should address a variety of aspects of human functioning to obtain information that would allow for holistic patient care. The keywords selected were questionnaire, quality of life, functional capacity, and physical condition, which were entered in different configurations using &. After the initial search, the following filter restrictions were introduced: (1) year of release from 2018 to 2023, (2) original research, and (3) intervention.

4 RESULTS AND DISCUSSION

The data collected using the EHR are used to holistically assess the patient's condition and plan to support his or her rehabilitation process at every stage.

In our analysis, we used the EHR literature, which was classified and stratified. The table below (Tab.1) present a summary of selected questionnaires verified on scientific evidence in intervention conditions. Literature review regarding the classification of the questionnaire on three issues regarding the qualitative component in its anamnestic subject context. The procedure used resulted in a collection of articles that were classified into three groups: (a) physical status, (b) functional capacity, and (c) quality of life analysed in detail. The our action was based on the assessment of the questionnaire and their synthesis to only one holistic tool whose we created for patient diagnosis.

Tab.1 Survey questionnaires, validated in the scientific literature, selected to create the CEAT tool

Physical condition	NMQ 6 and NMQ 7 questionnaires (the Nordic Musculoskeletal Questionnaire 7 days and 6 months)	Assessment of body posture for pain complaints (Kuorinka et al. 1987)	Assessment of individual body parts for pain: NMQ 6 assesses the last 6 months, NMQ 7 assesses the last 7 days
	SARC-F (Strength, Assistance with walking, Rise from a chair, Climb stairs and Falls)	The SARC-F is the most recommended screening tool (Bahat et al. 2022)	Assessment of sarcopenia risk based on 5 questions related to daily activities
Functional capacity assessment	New York Heart Association (NYHA) scale	Assessment of limitations for physical activity in terms of functional capacity (Bredy et al. 2018)	a 4-point scale, where I means ,,No limitation of ordinary physical activity", II- ,,Slight limitation of ordinary physical activity", III- "Marked limitation of physical activity", and IV- ,,Severe limitation of physical activity"
	CCS scale (the Canadian Cardiovascular Society)	A survey questionnaire assessing angina pain on a 4-point scale to evaluate limitation of physical activity (Kotajärvi et al. 2022).	A 4-point scale where I means ,,No limitation of physical activity" and angina pain not present during daily activity, II means ,,Slight limitation of physical activity", III means ,,Marked limitation of physical activity", and IV is ,,Severe limitation of physical activity"
	Duke Activity Status Index (DASI)	Estimation of MET during daily physical activity (Carter et al. 2002).	Respondents answer 12 questions about daily activities, then an estimated level of daily activity [MET] is determined based on the weights of the questions [MET]
Quality of Life	SCAP-A questionnaire (Screening Checklist of Auditory Processing)	Assessment of auditory processing disorders (Muthuselvi and Yathiraj 2009)	Respondents answer 'Yes' or 'No' to 12 questionnaire items. A point is awarded for each affirmative answer. A score of 6/12 means that these individuals are at risk for auditory processing disorders.
	Questionnaire survey World Health Organisation- Five	Assessment of well-being (Carrozzino et al. 2022)	Respondents assess the truthfulness of 5 statements on a scale from 0 to 5, with 0

For each of the results of the patient's anamnestic examination, the most frequently used in the available literature is: the New York Heart Association (NYHA) classification, Canadian Cardiovascular Society (CCS), Screening Checklist of Auditory Processing (SCAP-A), The World Health Organization-Five Well-Being Index (WHO-5), Duke Activity Status Index (DASI), the Nordic Musculoskeletal Questionnaire 7 days

(NMQ7) and 6 months (NMQ6), Strength, Assistance with walking, Rise from a chair, Climb stairs and Falls (SARC-F).

The survey questionnaires presented above were used to build a tool (CEAT) (in Polish version: "Kwestionariusz Pacjenta v1", available on
https://forms.office.com/e/X0prJFCL5d
and in the English version: "Patient Questionnaire v1" available on
https://forms.office.com/e/N2L6MvAaXn) as an implementation to anamnestic of diagnosis of subjective patient for a holistic solution to his needs using an electronic data collection.

The CEAT is a tool developed for the holistic assessment of a patient's health and well-being using EHRs supporting ACP. The CEAT tool consists of a history of physical status (weight, height, waist circumference), neurological incidents, cardiovascular disorders, past treatments/ surgeries, psychiatric disorders, and level of daily physical activity, supplemented by survey questionnaires selected in a literature review based on their widespread usefulness supported by scientific evidence. The questionnaires included in CEAT allow for a multifaceted assessment of the patient's health status, taking into account their physical state, functional capacity, and well-being.

In assessing physical status, in addition to the declarative data collected in the metrics of the CEAT tool, information on musculoskeletal pain in patients as one of the first symptoms of conditions is important. Screening for musculoskeletal conditions uses the standardized Nordic Musculoskeletal Questionnaire 7 days and 6 months (NMQ 7 and NMQ 6). Kurinoka et al. (1987) demonstrated the reliability of NMQ 7 and NMQ 6 to an acceptable level. The questionnaire is short and easy for the patient to answer. Its widespread use in the identification of musculoskeletal pain in different populations (Comruk et al. 2023) and different age (Asadi et al. 2023) and professional groups (Gandolfi et al. 2021, Geraldo & Fiorini 2022, Zwierzchowska et al. 2022) has been confirmed by numerous

scientific publications. In addition to chronic musculoskeletal pain, the patient's physical condition is threatened by sarcopenia, which can lead to adverse clinical effects such as falls, fractures, and physical disability (Bieniek et al. 2016; Cruz-Jentoft et al. 2019). According to the recommendations of the European Working Group on Sarcopenia in the Elderly, the F-A-C-S algorithm (Find-Assess-Confirm-Severity Pathway) is used for diagnosis. The tool recommended for use in the first stage in the F-A-C-S (Find) algorithm is SARC-F, with a sensitivity of 35.0-90.0% (Bahat et al. 2022; Krzymińska-Siemaszko et al. 2020). This questionnaire is commonly used in studies of adult and older adult populations (Williams et al. 2021, Ohkubo et al. 2022). Knowledge of the patient's physical condition, including musculoskeletal complaints and the risk of sarcopenia, is important for selecting appropriate forms of rehabilitation and planning the intensity and volume of exercise. The patient's functional capacity is also important in this context, with one of the indicators of its assessment being DASI (Duke Activity Status Index). Hlatky et al. (1989) showed a correlation of DASI with exercise testing. The DASI questionnaire contains 12 statements about activities of daily living assessed by the patient. Complementary to this indicator are the New York Heart Association (NYHA) scale and CCS, with a mutual agreement of 54%. NYHA, due to its simplicity, is widely used in clinical trials (Theuns et al. 2010) and allows a reliable assessment of functional capacity in patients with heart failure at a Cronbach's alpha level of 0.87, as demonstrated by Bredy et al. (2018) in a study of people with congenital heart defects. The NYHA scale is also used in patients with left ventricular dysfunction (Kempny et al. 2012). In contrast, the CCS scale is used to assess the level of angina in patients (Dybro et al. 2021). It assesses the presence of angina on a 4-point scale. The CCS scale score has been shown to correlate with quality of life, with the strongest correlations found in the group of questions on the respiratory system ($r = 0.40$) and vitality ($r = 0.30$) (Kotajärvi et al.

2022). The complementary NYHA and CCS scales and the DASI index provide a rapid and basic functional assessment of cardiorespiratory fitness in the form of an electronic health record (EHR) in advance care planning (ACP).

Over the past decade, research has seen a significant increase in interest in patients' quality of life because it is an important and complementary element of the holistic assessment of health (Fayers & Machin 2016). Haraldstad (2019) indicates that assessing patients' quality of life can inform the making and modification of medical decisions. Furthermore, Fayers (2016) indicates that the assessment of the quality of life is a predictor of treatment success, further highlighting the importance of screening patients for quality of life. At the same time, one of the components of quality of life is well-being, so it was important to use a questionnaire that selectively assesses well-being. A tool that is commonly used to subjectively assess a patient's general well-being is the WHO-5 questionnaire (Warr et al. 1985, Hall et al. 2011), which was incorporated into CEAT. The validity of the inclusion of WHO-5 in CEAT is supported by the results of a meta-analysis which showed that this questionnaire is a sensitive and specific screening tool for depression and that its usefulness in all fields of research is very high (Topp et al. 2015). Another aspect that cannot be overlooked when assessing quality of life is interpersonal communication skills. It is known that auditory processing ability deteriorates with age. Therefore, the identification of auditory processing disorders was one of the elements of CEAT that was important in the holistic assessment of the patient's health. A tool for assessing CAPD is the SCAP-A questionnaire (commonly used in research), with its effectiveness validated in Polish settings (Muthuselvi and Yathiraj 2009, Dajos-Krawczyńska 2016).

Finally, in our opinion, the proposed CEAT tool, which uses an electronic health record (EHR) procedure, allows for holistic patient assessment and advance care planning (ACP) in sanatoriums, rehabilitation hospitals, etc., and adaptation of the therapeutic process in these facilities to the patient's needs. As we have shown above, in the available literature, electronic health record (EHR) collection has functioned primarily as a tool for archiving medical data for facility documentation purposes to support the facility's operations. The CEAT tools developed by our team for rehabilitation hospitals and spas will, in our opinion, allow for improving the efficiency of working with patients by taking into account the holistic therapeutic process. At the same time, the tool will enable the planning of physiotherapeutic and nursing care. A strength of the CEAT tool is the complementarity of the questionnaires used. Furthermore, it can provide a good form of patient communication and education. The next stage in the development of the CEAT tool will be its validation for the needs of healthcare facilities.

5 CONCLUSIONS AND ACKNOWLEDGEMENT

The use of electronic health record (EHR) for advance care planning (ACP) using a holistic patient assessment tool prior to admission to a medical facility can be effective in tailoring treatment methods and forms of treatment.

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