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## Research Article

# INTEGRATION OF NURSING AND ELECTRONIC DEVICES IN SUDDEN CARDIAC DEATH PATIENTS: THE STRATEGY IN CONSTRUCTING HIGH- VALUE CARE

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### ABSTRACT

**Background:** Most of the SDC is caused by difficulties in early diagnosis and so does the side effect on psych and physics. Therefore, the role of nursing service is essential through strategy to improve quality of care. In this review, we updated the integration of the instrument and nursing facilitation may provide high-value care and achieve better medical and social support for SCD patients and families.

**Objective:** The purpose of this paper is to identify the strategy in constructing high-Value care integration of nursing and electronic devices in Sudden Cardiac Death Patients (SDC).

**Method:** This paper is narrative literature study. Computerized bibliographic data bases (Ebscohost, Google Scholar, Proquest and Science Direct) sought from the year 2000 until 2017 for original articles, focusing on nursing intervention, with keywords such as nursing practice, nursing intervention, Electronic Devices, Sudden Cardiac Death, the Nurse Strategy, High-Value Care.

**Results:** selected articles involving patients, discuss nursing care in SDS which significantly affect patients, such as pain, afraid, diet, psych and physical activities intervention. There is modern technology, wireless phone that enabling patients and clinicians monitoring and giving treatment to the patient as soon as possible and very costly. Previous study noted that patient and families should treat forever due to the side-effect of SDC.

Variations effect of the SDC for patient and family need special treatment. Terrible experiences on survivors make them afraid to get re-occurrence in the future; hence they need detail information how to do activity daily life. In addition, they have to changes the life style to prevent the second attack. On the other hand, the survivor family also being shock with the health status of the family especially if the patient dies. Remote monitoring enabling clinician monitors the patient's.

**Conclusion:** Nurse have strategic role in constructing high-value care for SDC Death patients by improve the level of education and skills in remote monitoring. Holistic nursing care in patients SCD and families need psych and physics approach leaves since its residual symptoms requiring special lifelong treatment causing many physical changes, social emotions and economic burden

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### INTRODUCTION

Sudden cardiac death (SCD) is a disastrous event, with a huge adverse impact on the health care and social system. More than 3 million people die each year in the world because of SCD. In the USA about 300,000-400,000 people die suddenly, where the number of deaths of patients due to SCD year equals total deaths due to AIDS, lung and breast cancer, and stroke combined Sudden cardiac arrest is an early indication of heart disease in both men and women with an incidence of 50% and 63% respectively and increases in age between 35-44 years old

[1]. Arrhythmia and acute coronary syndrome are the main causes of SCD that leaves residual symptoms requiring special lifelong treatment causing many physical changes, social emotions and economic burden [2, 3]. A new study found that cancer therapy also improve the atrial fibrillation [4]. This disease is an important health issue because of its attainment one-fifth of total deaths in industrialized countries and the high cost of treatment SCD has been widely dubbed since World War 2 last decade yet often unnoticed, with the most common cause being ventricular fibrillation (VF) or asystole [5]. SCD is

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also thought to be the cause of 10 times more deaths from traffic accidents in Europe and the USA, thus causing the need to understand the challenges of social change to prevent SCD. [6]

Nursing care plays a critical role in achieve high-quality care in management of SCD patients because they are experiences varies on bio-psycho-socio and spiritual. Some of them fell they are near to death, and so does the family. Previous study noted that anxiety and pain together with respiratory problems and mechanical ventilation common among patient with SCD that can be treated by clinicians by analgesics to reduce consumption of oxygen and decrease discomfort. This problem can achieve by facilitate nursing care and ensure patient safety [7]

To help patients have a good quality of life is one of the nursing approaches which can measure by QOL instruments. The quality of nursing care is one of the key success to deliver patients form bad experiences trough the illness phase. However, most of people even the nurses do not know what are the best nursing care with patients and families in this cycle. To Enhancing the nursing care along the patient's life-span is critical to serve with therapeutic strategies for achievement the quality of life and quality of care. [8]. Nurse should apply interventions in Nursing Intervention classifications (NIC) and Nursing Outcomes Classification (NOC[9]. NIC is a holistic systematically nursing care terminology that has been used in clinical settings to nursing care intervention. There are 514 interventions that grouping in 7 domains and 30 classes. NIC already develop and use in hospitals as electronic health records (EHRs). NOC is the expected result of giving action to the patient. Suitable NIC is use to lower stress levels and mortality rates [10].

Electrical device is widely used to detect, treat and prevent SCD. Implantable cardio venter (ICDs) is proven to reduce SDC due to its capability to combat malignant ventricular tachyarrhythmia and to restore normal cardiac rhythm.

This sophisticated technology work by overcome both shock and anti-tachycardia pacing (ATP) and decrease mortality in patient who at risk for SCD. [11] This edge technology available records the patient's diagnostic data automatically and sends to remote monitor (RM) that can be access by clinicians through wireless-based interface also provide alert systems. Recently study showed that RM benefit in patient safety, survival, rapid detection, reduction inappropriate shocks and reduce mortality. [12]

## METHODS

The method of this paper is narrative literature study. Computerized bibliographic data bases (Ebscohost, Google Schol ar, Proquest and ScienceDirect) sought from the year 2012 until 2017 for original articles, focusing on nursing intervention, with keywords such as Electronic devices, High-Value Care, Integration, Nursing care, and quality of life. In this review, we updated the current knowledge regarding the role nursing care in SCD and electronic device from original published online. Additionally, the integration of the instrument and nursing facilitation may provide high-value care and achieve better medical and social support for SCD patients and families. Outcomes are strategic role of nurses in constructing high-value care for SDC Death patients by improve the level of education and skills in remote monitoring. Data analysis with literature review.

## RESULTS

As much as 2471570 articles retrieved using Science Direct, Google Scholar, Ebscohost and Proquest. There are 1520000 articles based on title selection and the search strategy yielded 1280 potentially relevant papers through the screening of conformity of review objectives. After further screening in accordance with established methods, 54 articles were selected related on sudden death patients. The stress for family after sudden death can be seen on this tabel below.

**Table 1** Summary of stress after sudden death family.

Potential stress & functional	Impact on family	Nurse intervention	References
Communication stress	Validated information that patient already death Unbelievable that the body of the death is the same with body when he/she alive Need to see the patient in the custom when they are alive Need detail information about the time before patient death Need a privacy time and place to touch and to say goodbye with their beloved one	<ul style="list-style-type: none"> <li>• Preparing family for seeing the patient's body</li> <li>• Providing information re: status of patient</li> <li>• Offering food, blankets, a cot, etc.</li> <li>• Helping family get medical attention for themselves</li> <li>• Explaining procedures and processes</li> <li>• Comforting thedying</li> <li>• Providing empathy and support tofamily</li> <li>• Ensuring access to patient's body,time, and privacy</li> <li>• Offering a naming ceremony</li> <li>• Normalizing and validatingfeelings</li> <li>• facilitate to see the body of death</li> <li>• Give information</li> <li>• Givesupport</li> <li>• Give time to change thelife styles</li> <li>• Support for life changes</li> </ul>	<p>Linda Janzen. (2004) Omega journal of death and dying.</p> <p>Christina Harrington, 2012 #77} Omega journal of and dying death. {Christina Harrington, 2012 #77} {Anderson, 2015 Omega journal of and dying death. #15} Internati onal Journal of Nursing Studies</p>
Psychological stress	Denial, angry, sad, acceptance the health status change/ the death of their family	<ul style="list-style-type: none"> <li>• Support survivor decision</li> <li>• Support family discussion</li> </ul>	<p>{Dunbar, (2005) #33} American Journal of critical care {Emily P. Zeitler, 2016 #42} Trends Cardiovascula r Med. {Eric C. Stecker, 2015 #34} NIH Public Access, Circ Arrhythm Electrophysiol {Forchuk, 1995 #52}</p>
Decision of social-support (do not have money)	Need support from families and friends at memorial service, need everybody tell nice memory or good story about the patient. Need money support from others	<ul style="list-style-type: none"> <li>• Support survivor decision</li> <li>• Support family discussion</li> </ul>	<p>{Dunbar, (2005) #33} American Journal of critical care {Emily P. Zeitler, 2016 #42} Trends Cardiovascula r Med. {Eric C. Stecker, 2015 #34} NIH Public Access, Circ Arrhythm Electrophysiol {Forchuk, 1995 #52}</p>

distance of patients and nurses. The significance of the nurse's role fades. One study of the uniqueness and significance of care provides insight to realize the full potential of the nurse.

**Figure 1** Summary of the difficulty in sudden death survival patient

Problem	Potential stress & functional	Impact on family	Nurse intervention	References
Physical incapacity	Not as strong as before Easy to feel weakness Need more time to bed-rest	Stress Cost problem Depression	Supportive care Return to the normal life pattern. Rehabilitation in physic and psycho	{MIKOSC H P., 2010 #83}Journal of Advanced Nursing
	Intolerance activity Hypoxia Encephalopathy Vegetative status Stroke Neurological sequels Changes in sexual pattern			
Mental health disturbance	Psychological stress: loss of independence loss of Job, money, friends, dependence	Have the feeling of sense of support, Limitation, feeling anxiety and powerless. Tend to minimize the stress by seeking	Supportive caresupport socially Positive thinking Rehabilitation in physic and psycho.	

**DISCUSSIONS**

**Social burden of SCD**

The sudden burden of death, especially in men, is greater than all the burden of cancer and other causes of death. The social burden of the SCD is relatively higher than the cause of death due to other factors because the disease requires special health facilities, sudden onset of attacks, longer maintenance, and continuous lifetime. Therefore, a priority program should be developed to improve the national survey with the aim of obtaining prevention and treatment programs[13] SCD also causes changes in psycho-social effects on society and the families of victims, who feel they are still in their prime phase and it represents changes in the challenges of drugs, especially cardiology. Unfortunately most of people with SCDs do not show history of heart disease before. Thus, regular check-up is necessary to determine risk factors to identify people who need to change lifestyle and treatment and also motivate them to correct risk factors and refer to cardiologists if symptoms are present. Patients who are at risk of SCD should be known medical history, gender, and race. They should also be evaluated to lower out of hospital. For the population without a history of heart disease, health education needs to be done, understanding the signs of coronary disease including SCD[14].

**Nursing care in SCD**

**Nursing-based Strategy in health Care for SCD**

The modern healthcare system is transformed into a patient-centered approach where management is concerned about patient needs, values and preferences. [15] In this model, the patient is actively involved in the treatment. The concept of treatment demand is that the nurse understands the basic needs of the patient so as to help the patient make life as normal and productive as possible. This relationship builds on the basic forms of nursing practice and non-technical skills. Cooperation in nursing care is an important part of this section where they work together to decide on everyday life and care. In addition to the importance of nurses, the presence of nurses looks increasingly invisible to patients and families and other disciplines. The complexity of healthcare systems increases the

This concept can be used as a guide for practice and educational guidelines to build the professional identity of nurses. [16-19]

Nurses have begun studies to learn that nurses can take on a leadership role to increase the visibility of nurses in a multidisciplinary environment. They illustrate the conceptual model of nurse power through three phases of shared need, shared action, and reassurance. This effort is different in every phase. In the first phase the nurse takes the patient's special care and return to oneself. In the second phase of the nurse focuses on the patient's life to empower the patient to control his daily life. The final nurse's time gives special attention to the potential of the patient in the third phase. The nurse introduces a steady relationship with the patient and cares what is most important to the patient from the patient's perspective. The nurse adjusts the treatment to individual patients and encourages them to move forward [20]. If SCD victim is children, parents who are in grieving process say that they need providing empathy from nurse and so does support to family[21].

Nurse-leads are associated with high efficacy with the responsibility of lowering the composition of death from heart disease and hospitalization. A 35% relative risk reduction through this activity is very important and shows the beneficial effects of the management system. Nurse-lead care patients get better information about the disease and its management. The result is lowering related risks, hospital readmission and mortality. An important element in the chronicle care model with a comprehensive intervention basis focuses on nurse education, reassurance, prophylactic measures, guidelines, and the teamwork between nurse specialist and cardiologist. [22]

**Quality of life issues modulated by nursing cares in patient with sudden death**

The quality of nursing care plays a vital role in achieving high-value care for SCD patients. However, most of people even the nurses do not know what are the best nursing care with patients and families in this cycle. Enhancing the nursing care along the patient's life-span is critical to serve with therapeutic strategies for the quality of life and quality of care. There is a strong relationship between nursing care quality level with

participation and the quality of skills. University nursing graduates have a high effect on the quality of nursing care level so that nurse should continue their study [22, 23]. Although there is not always an option with SCD, the family presence during resuscitation will be very meaningful for the family and help the grieving process. The research on family attendance during invasive and resuscitation procedures found that families needed options offered and when to do. Families report experiences related to outcomes. [24]. One study with parents in the process of SDC in child noted that parents want to know the detail before the death of their love one, feel loss control and shattering the world as a parent before death, they need to say goodbye, interpret the sense of out of the death and find meaning, and attempts to carry. The participants rank that the relative importance of the 4 key elements in the notification process is: How, Where, Who, why he/she death) [25] Both memorial service and also religious procedure, are very supportive to families because can reduce the sadness and maintain comfort. Treatment activities were considered the most however care of the survivor needs to be individualized [26]. Another survey of 240 different professionals who routinely did death notification found that 40% had no previous experience about death notification. Reactions to survivors that is very difficult to do include regulating and self-injurious tendencies and others. The survivors need; spending time with family, talking with coworkers, and spending time alone.[27]. Specific details obtained in the research above are managed survivor reactions and how to manage their own emotional reactions. Another similar study found that 88% of participants found that it was very helpful in reducing stress. Most respondents thought that debriefings would be profitable after a critical incident. Debriefing is effective in preventing post-traumatic stress disorder and other psychological sequel. Some studies have even indicated that it may possibly cause worsening of stress-related. Researchers recommend that nurses and other health workers follow the steps in the death notification process i.e. preparation; initiating contact with the survivor; delivering the news; responding to survivor's reactions. Although many studies have assessed the quality of life of patients and families affected by heart attack / SDC, HRQoL's instruments are not yet able to measure accurately, suggesting the need to add the use of technic "Think Aloud".[1, 22, 23, 28-30]

#### ***Rehabilitation and education in preventing SCD***

Survivors and their families are both experiencing anxiety, symptoms of depression and fear. Explores need for psychological outcomes of patients with ICD in prevention SCD and arrhythmia handling are required. They experience fears that must be solved by increasing coping effectively and reducing the burden of health care [31]. Care and support in emergency room should be provided for patient and family optimally. Health care should have the information about family knowledge to support interaction with family. Previous study found that bereavement was very challenging and took long time for family members of survivors to respond. Going through days of unexpected death-induced changes is very hard for the family. The family is not able to face sudden resource changed so that it needs support from family and friends. They have to live with fragile emotions. Bereavement never ends

although acute shock, denial and emotional reactions will soon be addressed some time later. A study found that families reconciled themselves to the loss of a new life without the presence of loved one. Prompt decisions must be made while facing a sense of grief. The change from focus on loss to focus on future has been reported by some researchers. The dynamics and roles of the family are changing, and sometimes the child who supports adults as a child entertains one parent who is left behind. Some young people return home to support family members and communicate intensely. Some families seek meaning in life, changing from pragmatic to spiritual and personal. Learning aspects of the world physically, psychologically and socially. Participants demonstrate the importance of the social world, especially the family at this time. Because of its great effect on individuals, families and family systems and is universal, nurses should interact with family members to support during the grieving phase such as questioning the cause of death, because unanswered questioning can lead to a lack of knowledge of the causes that affect the ability to interpret loss. [16, 32-36]

#### ***Nurse-mastering Rehabilitation and education***

Nurses need to understand the rehabilitation and education process to help patients get out of the grief period. One program that has been developed is a follow-up telephone service for 2 months after death. The evaluation of this program after 10 years found positive effects for survivors and health care providers. They also reported other studies that found follow-up for 4-6 weeks after death in an emergency was received very well by survivors. The notification and others involved may also be affected by the actual notification experience and the stress of caring for victims and survivors of death. [27]. The best evidence practice to combat the mortality in SDC is ICDs however it has psychological and social effect such us anxiety and depressive symptoms. Nursing should provide holistic implementations include education and information, use of therapeutic communication techniques, follow-up assessment and interventions, and psychological approaches. Family supported by anticipatory guidance, problem solving focus, and strong relationships with their healthcare providers. [10, 37].

#### ***Provide family's time to say good bye to the body of sudden death***

Some SCD patients have been attacked in public area when they are separated for a while with family members. SCD makes the family find the patient dead at home, road or emergency room without a chance to say goodbye. Some families found that the SCD relative has significantly changed his body image so it gives a terrible impression. If the patient dies in the emergency room, the body must immediately be transferred to the autopsy room or mortuary room with a short time so that the family can- not sees it. The sadness of family members is increasing. The wishes were noted for the families to have a special time in touching the patient's face, dressing up with their favorite clothes in her lifetime, talking as if they were still alive[38]. Reaction of relatives vary depending on the character and quality relationship of the victim and family. The professionals most likely responsible for a death notification are physicians, nurses, emergency medical personnel, law

enforcement officers, social workers, and chaplains. The training represents the vital nature of the survival vital. Therefore nurses have the greatest chance to support the survivors and provide appropriate interventions that may ultimately influence how the survivor copes[25].

#### ***Rehabilitation and education in modulation on SCD sequel***

Patients who survived after SCD receiving ICDs still have physical, psychological and social consequences because they have high levels of anxiety and depressive symptoms. Many Quality of life (QOL) studies in patients with ICDS receive the device as well as feel shock. The treatment of ICDs is also unique, causing distress. Nurses should provide care with a holistic perspective [39]. Support groups should make time for patients to discuss expectations, and fears related to ICDs. In addition, side effects and residual effects on the physical form of hypoxia, encephalopathy, difficulty return to the normal life pattern and neurological sequels have its own burden for patients and families. Despite mild symptoms, patients may sometimes lose independence because family members are prohibited from taking breaks[10, 37].

#### ***Comprehensive rehabilitation program on physical and mental health***

##### ***Dealing with SD family's grieving***

The phenomenon of SCD studied by nurses is emotional expressions, a meaningful conclusion and building knowledge base. The nurse realizes the importance of reflecting on relevant training to support the environment. Pattern of communication that need for nurse are; problem solving about costs and care issues; change management leadership roles and communication experts; construction of new nursing identity, personally and professionally [40]. Death is common in hospitals, then understanding phenomena through process stage cyclic needs to be studied by nurse specialist. Effective death education from nurses needs to help patients face sudden death. Purpose death education is helping individuals face death effectively, increasing self-awareness and interpersonal skills and self-exploration and shared learning advocacy [29, 34, 36]. Previous study found that patients required counseling with nurses in exercise; get help to stop smoking, nutritional, management risk factors, and physical activity in cardiac rehabilitation [41].

##### ***Nurse-in-mastering the shock in SCD family***

Deaths often occur in the hospital so nurses often become accustomed and risk the process of dehumanization between life and death. The belief of existence of a gap between life and death makes the possibility of personal emergency in or not with the dead body. Sometimes the nurse regards the body as a cadaver or puppet only when the patient's family thinks it is a valuable item. Qualitative categories emerging that should be demonstrated such as e.g. preparation of the body, washing the body, wrapping the body, handing over property and valuables, which are presented with direct quotations from the emergency personnel. Nurse expression: dealing with the intricate, intimate and sometimes emotional moments in SD work and the process of disengagement from the deceased [42].

#### ***Nursing care in the stress in SD family***

Nurses need emotional support after death situation. The study found many variations of support for individuals. Nurses who are working in an area in which death occurs regularly should have access to a support system. Support is needed to enable staff to 'face' rather than evade 'difficult issues'. Debriefing after the crises also reduces the worker's anxiety level, and provides an opportunity to learn from the experience. Every nurse in the study emphasized the importance of conclusive to the accomplishment in each SCD episode. They recognized the mutual benefits that can be obtained by achieving such a conclusion[43]. Nurse's study identified three objectives: emotional expression; a meaningful conclusion; and how to build a sound knowledge base. In order to achieve their aims, nurses recognized the importance of reflection allied to relevant training strongly effective environment [44-46]. After sudden death, families need a time to talk about the detail of their beloved-one; nurse is the suitable person that able provides information. It is make nurse have a unique place in the survivors and families [47].

#### ***Emerging sociology of the sudden death***

Family of patient SCD experiences crisis while they should contact many professionals from notification until burial. Time to see the deceased is important to discussion. Commonly some of family get traumatic experience whenever sees the body of the death. Unfortunately, still debatable there is much see or not, thus some family who have seen have impacted on their grieving process; with themes: viewing specifics; intrapersonal responses; and professional interactions [48]. Social burden for SCD is expensive and higher than non-cardiac illness [13].

#### ***Quality holistic care for the suddenly bereaved with a Nursing***

Quality of care for SCD can be given with a 'culture of caring' with intervention to decrease the anxiety, to know the needs and expectations that can be given in multilaterally protocol. Professional commitment of team and personal can get from competence, experience, and education. Designing and testing a psycho-education intervention showed effect in decrease fear on patient and families. [49-51]

#### ***Mobile device***

When it comes to the topic of sophisticated devices, many people agree that this edge technology have many beneficial for patients, families' researchers, and countries. Previously researches already applied mobile in monitoring the patient's development. Remote monitoring (RM) manages patients with its capability to connect patients, providers and health systems get maximum benefit in cost and satisfaction because its can track heart rate, serum glucose and oxygen saturation by phone-cell in safety way. The next generation of RM possibly rigorous collect massive database in light, linking patients, provider and clinical outcomes.[52]

#### ***Integration of Nursing Care and Electronic Device in SCD Patients and families***

The edge technology such as RM is an easy way to prevent and treat arrhythmia. It is like mini and super devices to monitor heart rhythms and therapy, simple systems, pacing, improve autonomic activity and self-administration in pharmacological

agents. As consequence to envisioned advances evolve, nurses should be a pioneer in monitoring patient's and families' responses, testing cost-effective and checking psychosocial intact [1, 52].

The complexity of side effects of RM in patients and families need unique and different approach techniques where nurse approaches more in routine examination and health education. Nurses should work with multidisciplinary by patient-centered care model to deal with psychic complaints likes support services and counseling [30]. Despite thorough service in patients, outcomes after hospitalization did not increase. Therefore, it is necessary to develop strategies to reduce the incidence of re-occurrence of SDC. A study conducted the implementation of telemonitoring as a strategy for improving heart- failure outcomes to enable monitoring of patients in remote areas automatically so clinicians can provide early intervention if there is a change in health status. This study found that the death rate of patients with various causes fell by 44% and related hospitalizations by 21%. The methodology is to improve patient clinical status information, formal health education, medication management, or peer support. This research requires highly qualified and highly motivated case-manager nurses to apply the investigation team. But this study also leaves the question of whether the need for telephones per person will be profitable. However telemonitoring is not effective in considering alternative approaches in improving care [53, 54].

## CONCLUSION

Nurse have strategic role in constructing high-value care for SDC Death patients by improve the level of education and skills in remote monitoring. Holistic nursing care in patients SCD and families need psych and physics approach leaves since its residual symptoms requiring special lifelong treatment causing many physical changes, social emotions and economic burden.

## Conflict of interest

None declared.

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