

CHAPTER-II

REVIEW OF LITERATURE

A comprehensive literature search on topics relevant to the study was done to increase the understanding and assemble an adequate number of reviews for building the foundation of the present study. Reviews are organized under the following headings:

Coma definition, characteristics of comatose patients and its causes

A coma is a general term for an apathetic state in which the patient is not awake and is unable to respond to any environmental stimuli. The term consciousness content describes the consciousness level (i.e., the patient is coherent or he is confused, inattentive, or delusional). Many serious forms of brain dysfunction, such as stroke, trauma, hypoxia, and infection can result in coma.

Literature related to comatose patients

A systematic review done by Horsting on the causes and prognosis of non-traumatic coma from various databases like Pub-med, Embase, and Cochrane, showed that the common causes were stroke (54%), Infections (51%), post-anoxic (42%), poisoning (39%), and metabolic causes (29%). The prognosis was found to be progressive in patients with addiction and epilepsy, and poor in patients with coma and anoxic diseases.⁶¹

In a study Gaffer et al. evaluated 40 nurses' knowledge about unconsciousness. Results showed that 57.5% of nurses were satisfied with their knowledge regarding etiologies of unconsciousness, 60% had good knowledge about prevention of complications, and 63% were well-versed in use of GCS.⁶²

Rabinstein reviewed the diagnostic, therapeutic, and prognosis of coma from various studies, which showed that the use of technical advances could improve the accuracy of prognosis.⁶³

Muehlschlegel conducted a qualitative study with two phases on families and interdisciplinary health teams to gather "on-the-ground" opinions about the needs and experiences of families of patients with severe brain trauma, focusing on four key elements: challenges in dealing with early prognostic uncertainties, physical needs, empathetic and constant communication, and the need to include family in routine care practices. The study results recommended the role of stakeholders to identify new insights, including family members, which may enhance effective decision making and progressive physical/emotional outcomes in comatose patients with head trauma.⁶⁴

A case study was carried out by Steppacher et al. to highlight the importance of rehabilitation and towards better prognosis in comatose patients with severe head trauma induced coma and non-24-sleep syndrome. The study showed that in the beginning, the prognosis was devastating with many negative prognostic factors and associated multiple medical complications. However, the continuation of treatment and rehabilitation eventually proved to improve prognosis to a higher degree.⁶⁵

Studies on knowledge and practice of staff nurses

Sen evaluated knowledge of forty staff nurses regarding therapeutic communication before and after administering a self-instructional module on therapeutic communication. The samples were chosen using a convenient sampling method, finding of the study showed that, the post-intervention mean was higher than the pre-intervention mean score. The study found that that the intervention increased nurses' knowledge of therapeutic communication and could be practiced in clinical settings for better clinical outcomes in patients.⁶⁶

An evaluative study by Nael et al. on expertise of 60 nurses in providing care to adult unconscious patients revealed that nurses' knowledge was adequate.⁶⁷

A study by Patil to evaluate expertise of staff nurses' in handling unconscious patients revealed that nurses performed fairly well in are of skin care followed by fluid and electrolyte management, and lowest in area of care of patients with unconscious condition.⁶⁸

The knowledge of staff nurses on the care of unconscious patients was examined in a study by Savithri et al. by using a selective sampling strategy on 100 staff nurses. Results revealed that regarding the management of unconscious patients, only 17% nurses had adequate knowledge.⁶⁹

Raju et al. in a study showed an improvement in the nurse's knowledge ater intervention indicating effectiveness of self-learning module on nurses communication skills.⁷⁰

Jaddoue et al. assessed skills of 50 staff nurses while caring for neurologically unresponsive patients admitted to ICU. Study revealed that nurses lacked in demonstration skills in caring for comatose patients in areas such as airway care, accurate assessment, documenting of consciousness level, hygiene, stimulation of the senses, and urinary and digestive tract care. It was also found that there was a lack of ability to measure and record vital signs, dietary habits, and the maintenance of the bedside environment.⁷¹

Kashyap determined efficacy of a self-instructional module on communication with patients having altered consciousness. Sixty nurses working in the ICU were chosen using a straightforward, simple random sampling method. Their knowledge and skills to communicate with unconscious patients were also evaluated prior to and following the intervention. According to the study findings, post-test knowledge increased, concluding that self-instructional module (SIM) was a good way to inform nurses concerning the requirement of communication with patients with altered consciousness.⁷²

A quantitative descriptive study was done by Merchant on 31 ICU nurses regarding the time spent by nurses on verbal communication with patients admitted in ICU. Each nurse was observed over a period of 124 hours, over observation periods of 4 hours each session. According to the findings of the study, ICU nurses spent only 0.056% of their time in proper interpersonal conversation with patients. The findings of this study also indicated the exact verbal communication practices of ICU nurses. The study concludes that nurses need to spend time communicating verbally with patients and be vigilant in making conscious efforts to communicate verbally with unconscious or sedated patients.⁷³

Lotfi et al. conducted a study to determine patient experience with nurse-patient communication and nursing services in burns wards. Over 80% patients did not know their nurses. The study revealed poor communication between nurses and patients, and patient satisfaction was reported to be very low. The study concluded that improving patient satisfaction in hospitals must be a priority. Therefore, the staff, especially nurses, should be trained in proper communication skills to improve patient satisfaction.⁷⁴

In a quasi-experimental study with a mixed method approach, Dithole et al. examined communication styles and tactics to implement appropriate interventions regarding conversation between staff nurses and unresponsive patients in ICU. Quantitative data used were patient charts, protocols, family counselling meetings, service book reviews, and caregiver surveys. Qualitative data collection was done by verbally questioning the nursing staff and nursing service managers. The main conclusions of the study were the absence of documentation, including the use of alternative communication methods. Lack of cooperation between staff nurses and other medical professionals was also linked with ineffective patient communication in those who were being mechanically ventilated. The study's findings suggest that nurses need both informal and formal training to support them in keeping records and utilising the available communication channels.⁷⁵

On the basis of audited patient records, a retrospective study was undertaken by Dithole et al. Audits of patient files were performed for 149 patients. Over 90% of the audited files contained assessments of the communication skills of nurses. Only 4% of the respondents employed any other methods or tools to facilitate

communication beyond communicating the absolutely essential information. According to the findings, communication skills training is necessary to make sure that all nurses caring for patients who are mechanically ventilated, were appropriately prepared, trained, and capable of speaking with the patient in an efficient manner.⁷⁶

Urdiales et al. undertook a study on knowledge of most experienced ICU nurses, to investigate the elements of care that they possessed. A phenomenological and hermeneutic approach was used. Thirteen skilled critical care nurses who were selected through targeted sampling were interviewed. Following an assessment of knowledge relevant to daily practice, seven themes were identified. According to the findings, in seriously ill patients, the nurses daily use of practical knowledge has a significant impact on health of the patients. The study concluded that understanding the proper application of practical knowledge can help to improve the working methods of nurses with less experience.⁷⁷

A survey was performed by Bogossian et al. to assess the efficacy of a web-based simulation software on nursing students learning how to care for unconscious patients. By employing a convenience sampling technique, 409 nursing students were selected in the study. Result showed that 367 student nurses finished the entire online program, resulting in a completion rate of 89.7%. According to the study findings, the web-based e-simulation application significantly improved final year nursing students' knowledge, self-assessed knowledge, skills competence, confidence, and virtual clinical performance, related to the treatment of unconscious patients.⁷⁸

Nandaprakash et al. studied 76 hospital nurses regarding care of unconscious patients in special nursing skills like administration of oxygen, postural drainage, bed placement, nursing intervention for narcotic drug usage, and nursing action in assisting patients while information exchange. The study's overall total mean scores clearly show that all categories of nurses had an inadequate level of knowledge in basic nursing care. The research showed a statistically significant knowledge gap between specialty and general ward nurses.⁷⁹

A study was carried out to assess the efficacy of a teaching programme on staff nurses knowledge on care of unconscious patients. Result showed that a method of video-assisted instruction increased staff nurses' knowledge.⁸⁰

Munger et al. conducted a meta-analysis on communicating with unresponsive patients in intensive care units. The review discovered that a nurse's attitude, hospital techniques, and the workplace atmosphere are barriers to therapeutic nurse-patient interaction with comatose and vented patients. It was concluded that learning more about how communication can help and how to overcome perceived barriers, can help in improving nurses' care in the intensive care units.⁵³

Castelino et al, did a survey on 44 staff nurses to obtain their opinion on the situation, background, assessment, and recommendation technique (SBAR-technique) in the wards. The findings demonstrated that a significant proportion of staff nurses strongly agree on most of the situation, background, assessment, recommendation (SBAR) technique items while communicating during patient handoffs.⁸¹

C. Study related to assessment of patient's outcomes

Moattari et al. assessed the effect of sensory stimuli on mental function and basic cognitive sensorimotor rehabilitation of patients in coma. The study population consisted of 60 brain-injured comatose patients with a GCS <8. In terms of GCS, the results showed that patients who received sensory stimulation performed better than control group. Results found that applying sensory stimuli to comatose patients with severe injuries significantly improved their level of awareness, cognitive skills, as well as the recovery of their cognitive senses.⁸²

Salmani et al. studies the influence of family-centric emotional stimuli on comatose patients' awareness related to brain trauma revealed that the experimental group's level of consciousness was significantly higher (9.1 ± 2.1) than the control groups' (6.6 ± 1.7) and placebo groups' (7.2 ± 1.1) ($p < 0.001$). Additionally, the experimental group's Coma Recovery Scale score at the seventh day of the trial (11.9 ± 3.7) was substantially higher than that of the control (6.6 ± 1.6) and placebo (9.0 ± 2.0) groups ($p < 0.001$).⁸³

Abbasi et al. studied effects of regular family visit programmes on various stimuli of patients in coma because of head trauma. The findings revealed that the consciousness level improved in patients of experimental group after six days of treatment. The study concluded that frequent family visits may be considered as a strategic treatment modality.⁸⁴

Tavangar et al. conducted a single-blind, randomized controlled trial to see how family voices affected awareness of comatose patients. Study concluded that family sounds may help comatose individuals with acute subdural hematomas become more awake.⁸⁵

A randomized control trial was conducted by Varghese on 20 comatose patients, to measure the impact of spoken words on awareness level, responses in the physiology of body, and behaviour related reactions of patients who were in comatose state. The intervention group participants were exposed to their close relative's voice thrice in a day for 5 days. The patients' consciousness and behaviour were monitored for any changes. According to the results, in the intervention group behavioural reactions changed after commencing the intervention, however, blood pressure and oxygen saturation did not significantly change in response to voice for the patients in coma. According to the study's findings, comatose patients responded favourably to a voice stimulus with a familiar voice in terms of their consciousness and behavioural responses.⁸⁶

A study was done by Teats et al. to investigate whether bed bathing causes any pain for patients who are comatose. The study included 19 patients aged 61 ± 17.39 years. Saliva samples taken both before and after the bath containing the P substance (PS) (which is considered as the main nociceptive neurotransmitter of the primary sensory afferent nerve fibers). A statistically significant increase was observed in PS levels revealing that when specialized care given to comatose patients at the time of bathing, they experience pain.⁸⁷

An interventional study was carried out by Mohammad et al. to examine the efficacy of coma-wakefulness techniques on clinical outcomes in unconscious patients. A total of 60 patients were chosen using a random division into two groups. According to the findings, higher rate of physiological adverse events were significantly more in control group. This study concluded that coma- wakefulness techniques affected improvements in consciousness and sensory levels.⁸⁸

Jesus et al. conducted a two-step systematic search to assess the effect of a standardized stimulus message communicated verbally with an unconscious patient. Phase-I involved conducting a literature search and content analysis on comatose patients' communication conversations and language stimuli. The results of the systematic review were then used in Phase-II to help create a standardized stimulus message. The findings of the study showed four major areas of difficulty in communicating with unresponsive patients: work environment stress, limited knowledge of the needs of the unconscious patient, and a comprehensive understanding of how and why to communicate with comatose patients. The study concluded that developed stimulus has been shown to improve communication with communication patients.²¹

A randomized controlled experiment was conducted by Megha et al among 30 comatose patients to compare effect of three types of stimuli on awareness level. Group A received multimodal coma stimulation, Group B received simple stimulus, and Group C received traditional physiotherapy. The findings revealed a considerable difference ($p < 0.01$) in awareness level of comatose patients in Group A after brief and frequent stimulation.⁸⁹

Hoseinzadeh et al. carried out a clinical trial wherein the intervention group underwent organized auditory stimulation using the voice of a nurse trying to alert the patient of their location, time, identity, family, and occupation. It was observed that the consciousness level increased in both groups, but the intervention group increased more than the control group ($p < 0.01$). The findings showed that patient awareness improved after structured, organized auditory stimulation (OAS) by

nurses. Therefore, organized auditory stimulation may be a useful and appropriate initiative for critical care units.⁹⁰

In their clinical trial, Moghaddam et al. assessed effects of spoken word by family and the sound of prayer (Azan), as auditory stimulation, on hemodynamic changes in 51 comatose patients. One group of patients was assessed twice daily for 14 days while listening to the voices of family members through headsets during midday and evening times. Similar testing procedures and the sound of “Azan” were applied for the second group. Prior to and following each intervention, hemodynamic variations were measured. The results show that the post-test, particularly after hemodynamic parameters, improved significantly. The study concluded that acoustic stimulation had no homogeneous effect on the trend of increasing or reducing hemodynamic parameters studied. Because of the lack of consistency, they were not statistically meaningful or important.⁹¹

In a study by Younes et al. sixty comatose patients were randomly chosen from three ICUs and were divided into study and control groups, each with 30 patients. The implementation of structured communication messages was linked with a reduced incidence of physiological adverse events and a significant positive effect on the consciousness level. The developed communication message was effective to encourage interaction with patients in a coma state by caregivers.²⁷

D. Literature related to communication with comatose patients

(a) Verbal communication

(b) Non-verbal communication

An experiment by Cevik et al. was randomly controlled to explore the impact of organized voice by nurses on level of consciousness of comatose patients. Study comprised of 60 patients. The patient received the nurses voice recorded on an MP3, twice a day. Each time the voice recording was repeated three to four times. By the third day, there was a substantial difference in average GCS scores between the two groups, proving that hearing stimulation was linked to higher GCS in comatose patients.¹

An exploratory study was conducted by Rasmus et al. to analyze communication reactions at a minimal level of awareness in 18 patients with severe brain damage. Observations of various communication efforts were made during interviews with patients, carers, and family members, as well as the GCS scale and individual communication sheets. When comparing Stage II with Stage III, the results revealed a significant increase in preverbal communication. The study concluded that when patients awaken from a coma, they share information by using the preverbal level of primal conversation, sensorimotor, and behavioural activities.⁹²

A clinical trial was done by Yousefil et.al to look into the impact of family members sensory stimuli on the arterial blood oxygen in ICU patients. A total of 64 hospitalised patients in the ICU wards were randomly allotted into study and control groups by a simple random sampling technique. Patients' arterial oxygen saturation was measured before and following sensory input in both groups. The study

concluded that the use of sensory stimuli by close relatives enhances comfort and raises the arterial oxygen level in patients receiving critical care.⁹³

Park et al. conducted a crossover interventional study. Direct vs. non-auditory stimuli were given to nine patients who were in comas resulting from severe brain trauma. Direct auditory stimuli included a better interpersonal contact between the patient and the stimulus, such as a family member's or caregiver's voice, family advice, and favorite song. On the other hand, non-direct auditory stimuli, were characterized by common music and television noise. When direct and indirect auditory stimuli were given to patients, direct auditory stimulation significantly improved the somato-sensory assessment (SSAM) score compared to indirect auditory stimulation, as shown by the difference in improvement ($p = 0.021$).⁹⁴

A randomized study was conducted by Gorji et al. to look into how a familiar voice affects comatose patients' consciousness. The study recruited 13 patients with coma resulting from brain trauma. The test group was processed with a recognizable MP3 sound every day for 15 minutes over two weeks. In the control group only the atmosphere's real voice was heard. The results revealed that the experimental group took significantly less time to reach GCS=15. Gorji et al. concluded that it may be effective to provide a familiar auditory stimulation program to comatose patients in the ICU.⁹⁵

In another double-blind clinical trial done by Gorji et al., they compared the efficacy of known and unrecognized voices on the recovery of awareness levels in 45 comatose patients with a $GCS \leq 8$ in three groups. Group A received well-known voice, Group B received auditory stimulation by researcher, and Group C (control

group) received no intervention. The study findings revealed that group A, B, and C had average GCS scores of 6.40, 5.66, and 5.53, respectively. It was concluded that familiar voices could have a significant impact on the hearing levels of patients in the ICU. They concluded that auditory stimulation should be recommended for comatose patients.⁹⁶

Zuo et al. performed a systematic review to examine the variables influencing the clinical outcomes as well as the impacts of family-centred sensorimotor and affective stimulation on patients with head trauma. The reviews and meta-analysis included 17 randomized controlled trials. The study findings revealed that auditory stimuli combined with tactile and multisensory stimuli produced better results than a single application of auditory stimuli. It was also found that multisensory stimulation was more effective than single stimulation and that early sensory and affective stimulation provided by the family was better compared to routine care.⁹⁷

Mandeep et al. evaluated the effect and usefulness of coma arousal therapy in comatose patients after brain trauma. Brutal head injuries were the cause of 30 comatose patients who were systematically randomized, keeping 15 patients in each of the experimental and control groups. Coma Recovery Scale and Glasgow Coma Scale scores were evaluated before and after the 1-week and 2-week protocols. According to the study findings, coma arousal therapy significantly improves GCS and CRS in the experimental group patients.⁹⁸

Li et al. performed a double-blind, study on efficacy and safety of conventional rehabilitation in combination with trans cranial direct current stimulation therapy. Eighty patients who experienced head trauma and had

awareness disorders were randomized into two groups. Direct current brain stimulation or traditional rehabilitation combined with active direct current stimulation was given to the experimental group. Measurements for the primary outcome were made initially and every week for 4 weeks. According to study findings, DCS has been used as a painless, non-invasive, simple-to-use, and available treatment for patients with central nervous system lesions.⁹⁹

A cluster randomization study by Kalani to ascertain the impact of family-led visits on the degree of awareness in traumatic patients in ICU between the experimental and control groups, For 14 days, a trained family member visited the patients in the intervention group daily, providing touch and auditory stimulation. According to the findings of the study, organized family meetings can improve the level of consciousness in comatose patients. The study recommended the training of family members to perform sensory stimulation at the proper time.¹⁰⁰

Sullivan conducted a blinded crossover study for the assessment and care of trauma patients who had long-term, seriously impaired periods of consciousness. Neurobehavioral measures were used to collect baseline data for 4 weeks for variations in status. ‘Brainstem Auditory Evoked Potentials’ (BAEP) and ‘Somatosensory Evoked Potentials’ (SSEP) were among the pre-stimulation neurophysiological evaluations that were completed. The ‘Disorders of Consciousness scale (DOCS) neurobehavioral findings were significantly improved as a result of the study. Additionally, BAEP results improved and were maintained after sham stimulation.¹⁰¹

Khojeh et al. did a study to assess how familiar voice for auditory stimulation affects the physiological parameters and pain level of comatose patients. For the study, 40 intubated patients were randomized into two groups. The experimental group received auditory stimulus daily over 3 days for 15 minutes, only by the patient's near/dear person. At regular intervals, predicted biological indices and pain were monitored. The experimental group experienced a significant reduction in pain intensity ($p=0.019$) when compared to the control group. Study concluded that patients in the ICU experienced less pain after hearing a familiar voice, but the biological indices were not significantly changed.¹⁰²

Happ et al. conducted an observational study on how nurses communicated with critically ill patients who could not speak. Study findings showed that 86.2% nurses communicated with patients. Making eye contact with the patient was the most common positive act performed by nurses. The study's findings highlighted particular points for enhancement in ICU communication between nurses and patients who couldn't speak, such as pain assessment as well as the utilization of assistive approaches and communication methods.¹⁰³

Alam et al. studied effectiveness of a sensorimotor arousal programme on the clinical outcomes of brain trauma patients. A total of 60 patients were selected and randomly split into two groups. The patients in the intervention group improved in consciousness, cognitive and sensory functions significantly after completing the sensorimotor stimulation programme. According to the study results, approximately two-thirds of the study group (60%) had a shorter ICU stay (1,520 days) compared to (33.3%) % of the control groups. The study concluded that application of the

sensorimotor stimulation programme improved clinical parameters and reduced the length of hospital stay in patients in combinations of medical interventions.¹⁰⁴

A retrospective cohort study was done by Leonardi et al. to compare the long-term functional outcomes, improvement, or impairment of function of patients in a vegetative state (VS) with minimal consciousness (MCS), 1 year after the onset of coma, then annually for up to 5 years. The clinical courses of 12 patients in VS and 39 patients in MCS were reviewed. Outcomes were assessed at second, third, fourth, and fifth years post-injury using the five items of the Glasgow Outcomes Scale. The study showed that no patient in VS improved during follow-up. The study concluded the need to reliably define boundaries between VS and MCS using repeated clinical assessments and all available neurophysiological and imaging tools.¹⁰⁵

Rashidi conducted a clinical trial on 74 comatose patients in ICU to assess their hospital stay duration and ventilatory dependency rate by utilizing the RASS. The study findings revealed that both the groups were different with regard to ventilatory dependency rates. In the study group, conditions improved. According to the study results, this protocol can significantly improve the way that sedatives are used in the ICU.¹⁰⁶

Summary

The review of both academic and popular literature related to the problem at hand is covered in this chapter. This review has given the reader an understanding and broadened the researcher's perspective that are essential for the research study. The literature was reviewed to familiarize oneself with various facets and problems connected to the problem under study. The review has made it possible for the researcher to determine why the study is necessary, develop a conceptual framework, adopt a research methodology, create tools for the carry out data collection, and create a plan for data analysis.