Review Article

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# Burnout among Dialysis Nurses and Technicians: A Narrative Review

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## ABSTRACT

Burnout is a chronic occupational psychological strain or stress. Haemodialysis nurses and technicians are healthcare professionals dealing with End-Stage Renal Disease (ESRD) patients. Sociodemographic characteristics, work environment and stress are some of the factors causing burnout in haemodialysis nurses and technicians. And also, the burnout is influenced by high workload, low salary, and poor professional relationships. The most commonly used burnout measurement tools are the Maslach Burnout Inventory, Burnout Measure, Oldenburg Burnout Inventory (OLBI), Copenhagen Burnout Inventory, Shirom-Melamed Burnout Measure (SMBM) and Burnout Assessment Tool (BAT). Burnout in this population is typically characterised by three key dimensions. They are emotional exhaustion, depersonalisation, and a diminished sense of personal accomplishment, which are highly prevalent among haemodialysis nurses. The impact of burnout extends beyond individual well-being, affecting patient care quality, workforce stability, and the overall healthcare system.

**Keywords:** Haemodialysis ,Healthcare professionals, Patient care quality, Workforce stability

## INTRODUCTION

Burnout is a chronic occupational psychological strain or stress [1]. Haemodialysis nurses and technicians are essential healthcare professionals in the dialysis team involved in initiating and terminating the dialysis procedure, managing complications, monitoring vital signs, and administering medication during dialysis [2]. These professionals provide life-sustaining haemodialysis treatments multiple times per week [2]. Burnout is a significant and growing concern in healthcare, particularly among dialysis nurses and technologists who work in high-stress, emotionally demanding environments [3]. In the haemodialysis unit, nurses and technicians continuously care for the same patients undergoing treatment. Many of these patients have End Stage Renal Disease (ESRD) and, due to their chronic condition, cognitive impairment, or psychological state, may sometimes be verbally or physically aggressive [4]. Since there is no definitive cure for these patients, witnessing their health deteriorate over time can be emotionally challenging and is a significant source of stress for the staff, potentially affecting their overall quality of life. High workload, low salary, and poor professional relationships influence haemodialysis technicians' burnout [5]. Other factors, such as age, gender, educational status, and relationship with colleagues, play a significant role in the burnout of haemodialysis nurses [5]. Burnout in this population is typically characterised by three key dimensions: emotional exhaustion, depersonalisation, and a diminished sense of personal accomplishment, which is highly prevalent among haemodialysis nurses [6]. Prolonged exposure to occupational stress can result in both physical and mental exhaustion for haemodialysis staff, potentially leading to burnout and different levels of depression [4]. As the demand for dialysis services increases globally, addressing burnout in dialysis staff has become a health priority. Enhancing working conditions, fostering positive relationships among colleagues, and offering additional education in dialysis are essential steps in reducing burnout syndrome. Burnout prevention programmes should primarily target younger professionals [6]. This literature focuses on the definition and symptoms of burnout, different kind of burnout measurement tools, prevalence, factors leading to burnout in dialysis nurses and technicians, the impact of burnout, and coping strategies.

### Definition and Symptoms

Herbert Freudenberger first introduced the concept of burnout. He defined burnout as "a state of fatigue and frustration brought about by devotion to a cause, way of life or relationship that failed to produce the expected reward" [7]. Then Maslach C et al., visualised burnout as a scientific concept and developed the Maslach burnout Inventory (MBI). "Burnout is a psychological syndrome of emotional exhaustion, depersonalisation and reduced personal accomplishment that can occur among individuals who work with people in some capacity" - defined by Maslach C et al., [1]. According to Maslach C et al., three central concepts of burnout are; Emotional exhaustion is the drainage or depletion of an individual's emotions, where they feel no longer available emotional resources at a psychological level, depersonalisation is the development of negative attitudes toward colleagues, clients, or other individuals, creating an emotional distance, Personal accomplishment is the negative thought of self-evaluation, feeling unhappy, and unsatisfied with one's accomplishment [1]. According to the International Classification of Diseases (ICD-11), "Burnout is a syndrome conceptualised as resulting from chronic workplace stress that has not been successfully managed [8]. It is characterised by three dimensions: feelings of energy depletion or exhaustion; increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and reduced professional efficacy" [8]. Exhaustion and disengagement (from work) are the core concepts of burnout [9]. Exhaustion is defined as a consequence of intense physical, affective, and cognitive strain, which is similar to that of others [9]. On the other hand, disengagement is the distance between an individual and their work object or content [9]. Physical fatigue (low energy and tiredness of daily work), emotional exhaustion (loss of interest in showing empathy to clients and colleagues), and cognitive weariness (reduced thinking agility and slow thinking) are the symptoms of burnout [10]. Overall emotional exhaustion, mental exhaustion, depersonalisation, reduced personal accomplishment, disengagement, physical fatigue, and cognitive weariness are common symptoms of occupational burnout. Kristensen TS et al., divided the occupational burnout into personal burnout, work-related burnout, and client-related burnout, which are defined as follows:

i "Personal burnout is the degree of physical and psychological fatigue and exhaustion experienced by the person" [11].

ii "Work-related burnout is "The degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his or her work" [11].

iii "Client-related burnout is the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his or her work with clients" [11].

### Prevalence of Burnout

In the current scenario, burnout is a common issue among healthcare professionals. A meta-analysis of systematic reviews reveals that 12 to 45.6% of practicing health professionals experience burnout [12]. A 31% on emotional exhaustion, 24% on depersonalisation, and 38% on personal accomplishment of practicing nurses were found in a meta-analysis [13]. A total of 44.6%, 26.9% healthcare workers have personal burnout and pandemic-related burnout, respectively, during the COVID-19 pandemic in India [14]. A prospective study revealed that 42% of haemodialysis nurses of a Haemodialysis (HD) centre of the Kingdom of Saudi Arabia have a moderate level of burnout, and 32% of haemodialysis nurses have a higher level of burnout [4]. In the same study 38% and 5% of expatriate nurses (Filipinos, Indians, Indonesians, and Pakistanis) have moderate level and high level of burnout, respectively. 57.5% of US dialysis Patient Care Technicians (PCT) has burnout [5]. A multi-centre study in Northern Italy found 27.2% of dialysis health care providers (nurses and physicians) have a higher level of emotional exhaustion, 17.3% have both higher depersonalisation and personal accomplishment [15]. Flynn L et al., bring alarming information that one-third of US haemodialysis nurses have burnout symptoms [16]. These all data reveal that burnout is an essential concern among dialysis nurses and technicians.

## DISCUSSION

Most commonly used burnout measurement tools are the Maslach burnout Inventory, burnout Measure, OLBI, Copenhagen burnout Inventory, SMBM and BAT [Table/Fig-1].

### Maslach Burnout Inventory (MBI)

The MBI is a "Gold standard" tool, self-administered questionnaire, developed by Christina Maslach and Susan E Christina in 1981 for burnout measurement. A total of 22 questions were divided into three subscales, with nine items in the emotional exhaustion subscale, five in the depersonalisation subscale, and eight in the personal accomplishment subscale. It is a 7-point Likert scale ranging from "Never" to "Every day". 10-15 minutes are required for responders to fill out the questionnaire. Burnout level assessment based on the total score of each subscale, not on the overall score. Higher scores in emotional exhaustion, depersonalisation, and low scores in personal accomplishment indicate burnout [1].

### Oldenburg Burnout Inventory (OLBI)

The OLBI is a 16-item scale developed by E. Demerouti in 1991 to measure occupational burnout of the general population. Exhaustion (8 items) and disengagement (8 items) is the central core of this questionnaire, consisting of positively and negatively worded items. It is a 4-point Likert scale ranging from 1 (strongly agree) to 4 (strongly disagree). Positively worded items are reversed-scored. Total score ranging from 16 to 64, where a high score indicates a higher level of burnout [9].

### Copenhagen Burnout Inventory (CBI)

In 2005, the Copenhagen burnout Inventory (CBI) was designed by Kristensen TS et al., to assess burnout in individuals working in human service sector. The 19 items in the CBI are divided into three domains: work-related burnout, which assesses burnout specifically related to one's job role; client-related burnout, which gauges fatigue associated with interactions with clients, patients, or service recipients; and personal burnout, which gauges the level of overall physical and psychological exhaustion. Every item is scored on a 0-100 scale, with higher scores denoting higher levels of burnout. Each item is rated on a five-point Likert scale. The CBI's simplicity and adaptability to a wide range of professional contexts, such as the healthcare, educational, and service sectors. However, in contrast to other tools, it focuses on exhaustion as the primary component of burnout and ignores aspects like depersonalisation or decreased personal accomplishment [11].

### Burnout Measures

In 1981, the burnout measure was developed by Pines AM and Aronson E. It is a self-administered, 21-item questionnaire most useful for various professionals. Three major dimensions are physical fatigue, emotional exhaustion, and mental exhaustion. Seven items for each dimension ranging from "never" (1) to "always" (7). Scoring

| Tool | Developed by and year | Items & structure | Dimension measured | Scale | Scoring/interpretation |
|---|---|---|---|---|---|
| Maslach Burnout Inventory (MBI) | Maslach C et al., 1981 [1] | 22 items:3 subscales | Emotional exhaustion<br>Depersonalisation<br>Reduced accomplishment | 7-point Likert (Never → Every day) | Burnout is identified when high exhaustion and depersonalisation are combined with low personal accomplishment, with interpretation based on subscale scores rather than an overall score |
| Burnout Measure (BM) | Pines AM 1993 [17] | 21 items; 3 dimensions (7 items each) | Physical Fatigue<br>Emotional exhaustion<br>Mental exhaustion | 7-point Likert (Never → Always) | Mean score interpretation: 1-2 indicates euphoria, 3-4 suggests a need for change, and scores above 4 indicate that intervention is needed |
| Oldenburg Burnout Inventory (OLBI) | Demerouti E and Bakker AB [9] | 16 items:2 subscale | Exhaustion<br>Disengagement | 4-point Likert (Strongly agree → Strongly disagree) | The total score ranges from 16 to 64, with higher scores indicating greater burnout; positively worded items are reverse-scored. |
| Shirom-Melamed Burnout Measure (SMBM) | Shirom A 2003 [10] | 14 items: 3 domains | Physical Fatigue<br>Emotional exhaustion<br>Cognitive weariness | 7-point Likert (Never → Always) | The total score ranges from 14 to 84, with a mean score of ≥4.4 indicating clinically relevant burnout. |
| Copenhagen Burnout Inventory (CBI) | Kristensen TS et al., 2005 [11] | 19 items: 3 domains | Personal Burnout<br>Work related burnout<br>Client related burnout<br>(Exhaustion mainly focused) | 5-point Likert; converted to 0-100 | Higher scores indicate greater burnout; the tool is adaptable across professions, but does not assess depersonalization or reduced personal accomplishment. |
| Burnout Assessment Tool (BAT) | Schaufeli WB et al., 2019 [19] | 33 items: core scale (23items); secondary scale (10 items) | Core<br>Exhaustion<br>Mental distance<br>Emotional<br>Cognitive impairment<br>Secondary<br>Depressed mood<br>Psychological distress<br>Psychosomatic complaints | 5-point Likert (Never → Always) | In the Burnout Assessment Tool (BAT), a mean BAT-C score of ≥3.02 is considered indicative of severe burnout, coded as red, while scores of ≥2.59 represent individuals at risk of burnout, coded as orange. Similar cutoff values are also established for the shorter version, BAT-12, ensuring consistent identification across both formats |

**[Table/Fig-1]:** Overview of standardised tools for measuring burnout [1,9-11,17,19].

based on the mean score of the total score and interpretation has categories such as 1-2: constant euphoria, 3-4: need for change, and>4: requires interventions [17].

### Shirom-Melamed Burnout Measure (SMBM)

Based on physical fatigue, emotional exhaustion, and cognitive weariness, a 14-item questionnaire was developed by Shirom A and Shlomo Melamed to measure burnout for clinical purposes. SMBM is a 7-point Likert scale, ranging from "never or almost never" (1) to "always or almost always" (7). A score between 14 and 84, a mean score of 4.4 or higher, indicates that individuals have clinically relevant burnout [18].

### Burnout Assessment Tool (BAT)

The BAT is a newly structured questionnaire that addresses the limitations of the Maslach burnout Inventory, developed by Schaufeli WB et al., [19]. The four core dimensions of this tool are exhaustion, mental distance, and impaired emotional and cognitive impairment, and the three secondary dimensions are depressed mood, psychological distress, and psychosomatic complaints. The questionnaire consists of 33 items and includes the BAT-C and BAT-S. The BAT-C assesses the four core dimensions and contains 23 items, while BAT-S consists of 10 items that assess the two secondary dimensions, psychological and psychosomatic complaints. It is a 5-point Likert scale ranging from "never" (1) to "always" (5). People with a mean score of 3.02 or more on the BAT-C should suffer from severe burnout, coded with a red label, whereas those scoring 2.59 or higher are at risk for burnout, coded with an orange label. The corresponding values for the BAT-12 are 2.96 and 2.54, respectively [19].

### Factors Affecting Burnout among Haemodialysis Nurses and Technicians

Sociodemographic characteristics, work environment and stress are influencing burnout in haemodialysis nurses and technicians. Roles of all factors are described as follows.

**Sociodemographic characteristics:** Males are associated with a high level of depersonalisation [15], whereas another study suggests that females exhibit a higher level of depersonalisation [20]. Younger-age nurses have higher levels of depersonalisation and lower personal accomplishment [6], indicating that they are prone to burnout. In contrast, older staff members experience higher emotional exhaustion levels [21]. Other studies indicate that age does not play a significant role in burnout [19,22]. Single nurses reported a higher level of burnout than married nurses [20]. Education significantly influences burnout; for instance, nurses with a health occupational high school education experience higher levels of emotional exhaustion compared to those who have graduated from university [20]. Higher levels of emotional exhaustion and lower levels of personal accomplishment are seen in nurses who have children [20]. The impact of sociodemographic characteristics on burnout varied due to several cultural and local variables. So, sociodemographic characteristics cannot be considered as stable predictors of burnout.

**Stress:** According to Karkar A et al., technological breakdown or defective machines, exposure to needle stick injury or bloodborne infection, having to work for long hours, job insecurity, demanding and manipulative patients, and overwork are the major factors of stress in haemodialysis nurses [4]. The study revealed that there is a positive correlation between stress and burnout in dialysis nurses [4]. These findings suggest that stress plays a major role in burnout in haemodialysis nurses.

**Work environment:** The work environment shapes occupational behaviour, influencing how an individual experiences their work environment. The factors causing burnout in the working environment are listed as:

**Work load and work hours:** Over or higher workload causing burnout in dialysis staff [4,5,20]. Severe exposure to the renal unit environment can lead to decreased personal accomplishment [23]. According to the US Department of Health and Human Services, in a dialysis unit, on each shift, the patient-to-technician ratio should be 3:1 [24]; but a study revealed that technicians are treating more than 9 patients in one shift, which causes burnout in dialysis technicians [5]. In a similar vein, another study result revealed that a higher patient ratio is a contributing factor for burnout [16]. Dialysis nurses are more prone to burnout in terms of depersonalisation, especially those who work more than 50 hours per week [6]. Training is essential in professional organisations to manage the stress of the workload, which can reduce burnout. Nurses with inadequate training have a higher level of burnout [5,6].

**Salary:** A professional's income (salary) is also a contributing factor for burnout in dialysis technicians; in this study, participants addressed that they are getting less salary compared to unskilled labourers in the USA [5]. In contrast, Kavurmacı M et al., stated that income status does not plays a contributing factor for burnout [20].

**Working experiences, supervisor support and team dynamics:** A good, co-operative and positive environment can reduce occupational stress. Burnout is frequently common in nurses with short working experiences in dialysis settings [6,18]. Other studies results find that there is no relation between working experience and burnout [16,20]. Nurses who have problems or a bad relationship with colleagues are associated with a higher level of depersonalisation [6,15]. Burnout level is higher in those nurses who have the intention to work in another unit and do shift duties [6]. Nurses have a lower level of personal accomplishment due to no permanent position in the unit [4,15]. A less supportive work environment and due to activity care has an impact on dialysis nurses in the US [16].

**Types of working institutions:** The types of work institutions have an impact on burnout. For instance, nurses working in private hospitals have a medium level of burnout compared to those working in state hospitals [20,25]. Additionally, university hospital nurses are prone to burnout, particularly in the personal accomplishment scale [26]. Dialysis nurses have less burnout than ward and Intensive Care Unit (ICU) nurses in terms of less workload, older age, being free from night duties, working experience, patient-to-nurse ratio relationships with co-workers [22].

**Emotional demands:** Decrease in patient satisfaction attributed to emotional exhaustion in dialysis staff [26]. While showing empathy to patients increased the level of personal accomplishment of nurses [15]. Neglected but important factors like complaints, harassment of patients and caretaker playing a significant role in dialysis nurses' burnout [25].

Overall, factors of work environment either influencing or not influencing burnout in dialysis nurses were to different study settings (countries, government and non-government hospitals), working shift, relation with coworkers, salary and patient-to-health care providers ratio. Several international studies may bring the limelight to the causes of dialysis nurses and technicians' burnout.

### Impact of Burnout

In dialysis care, patients require frequent, long-term treatment and staff are consistently engaged in repetitive, technically demanding, and emotionally intensive work. Its impact extends beyond individual well-being, affecting patient care quality, workforce stability, and the overall healthcare system.

**Staff burnout and patient care:** The majority of the article demonstrates a negative relationship between the quality of patient care and staff burnout. According to studies, nurses who are emotionally spent are more likely to show less empathy and compassion, which can harm nurse-patient relationships and decrease patient satisfaction [27]. According to Hall LH et al., (2016), depersonalisation, a fundamental aspect of burnout, is

associated with disengagement and unfavourable sentiments towards patients, undermining therapeutic communication and trust [28]. Additionally, burnout directly jeopardises the quality of patient care by causing a rise in medical errors, lapses in infection control, and a lack of attention to patient safety procedures [28]. High levels of burnout are also linked to increased absenteeism and staff turnover, which results in a shortage of workers that puts additional strain on healthcare systems and compromises continuity of care [29]. Burnout can lead to both technical errors and emotional disengagement in specialised units like haemodialysis, where patients need long-term, repetitive, and technically precise interventions. This can harm treatment adherence and patient trust [16]. All of the evidence points to burnout as a major obstacle to providing safe, efficient, and compassionate patient care, not just a problem with the workforce.

**Depression among staff:** Burnout and depression are strongly positively correlated, according to systematic reviews and meta-analyses; the strongest correlation is seen with emotional exhaustion [30,31]. Persistent sadness, hopelessness, and decreased motivation are more common among nurses who are experiencing high levels of burnout, which worsens emotional detachment and lowers the standard of patient care [32]. Chronic workplace stress is a major predictor of mental health decline, according to studies conducted during the Coronavirus Disease 2019 (COVID-19) pandemic that also showed medical staff with higher burnout scores had significantly higher depressive symptoms [33]. In general, the relationship between depression and burnout produces a vicious cycle in which stress at work worsens mental health, which in turn causes depression to hasten professional disengagement, endangering patient safety as well as staff well-being.

**Burnout and physical health:** Burnout has significant effects on physical health in addition to psychological ones. According to Salvagioni DAJ et al., chronic burnout has a systemic impact because it is linked to gastrointestinal issues, musculoskeletal pain, cardiovascular diseases, and chronic fatigue [34]. Additionally, burnout raises the risk of metabolic syndrome and cardiovascular morbidity [35]. Furthermore, Peterson U et al., found that people with high burnout scores had greater rates of somatic complaints and sleep disturbances [36]. In addition to endangering the health of employees, these physical manifestations put a strain on healthcare systems by increasing absenteeism, decreasing productivity, and causing long-term disability.

Burnout among dialysis staff has multifaceted and far-reaching effects. It compromises patient care and safety, reduces patient satisfaction, increases turnover, and destabilises dialysis services [16,27-29]. Addressing burnout requires systemic interventions, including workload adjustments, supervisor support, improved teamwork, recognition of staff contributions, and opportunities for ongoing education [30,31]. Without such measures, burnout will continue to threaten both the well-being of dialysis professionals and the quality of care delivered to patients [28].

**Coping method:** Coping with burnout among haemodialysis nurses and technicians requires both individual strategies and organisational interventions. Haemodialysis nurses often rely on personal stress-reduction techniques. Common methods include relaxation practices (20-25% of nurses), directly confronting problems, and learning new skills to address challenges. Other strategies involve releasing pent-up emotions, using humour, managing hostile feelings, and distancing themselves from stressful situations. Less frequently, denial and distraction are used as coping mechanisms [4]. Nurses also reported that improving personal resilience through sleep, exercise, nutrition, meditation, and social support from family and friends helps buffer the effects of stress [4].

Workplace conditions strongly influence burnout. Nurses and dialysis PCTs emphasised the importance of supervisor support, respect from colleagues, and interprofessional teamwork. A lack of respect or poor team collaboration was linked with higher burnout, while supportive environments promoted fulfillment [5]. Involving both management and nursing staff in working groups to redesign shift patterns and address time constraints has been suggested as a way to reduce stress [4]. Regular feedback, empowerment in decision-making, and opportunities to influence workload also contribute to reduced stress [37]. Daily exercise, do not bring workload home, hobbies, yoga, meditation, relaxing methods and minimising stress by taking breaks during work are significant strategies to manage burnout [38]. Continuous education, structured orientation programmes for new staff, and clinical supervision are essential for building competence and confidence. Studies show that nurses who regularly attend training programmes report lower depersonalisation and higher personal accomplishment [6]. For PCTs, insufficient training is a major stressor [5]. Many felt unprepared for complex tasks, underscoring the need for standardised, high-quality training and certification to ensure safety and job satisfaction [5]. Workload and staffing patterns are critical. Many dialysis staff reported excessive work hours and high patient loads, which directly contributed to burnout. Interventions such as enforcing appropriate patient-to-technician ratios, reducing overtime, and ensuring adequate staffing levels were identified as necessary coping supports [5]. Better salaries and benefits were also highlighted as important to reduce turnover and improve morale [5]. Access to counseling, peer support groups, and structured stress-management interventions can enhance coping. For example, relaxation training, desensitisation techniques, and biofeedback have been recommended to help staff manage stress more effectively [4]. Emotional support from colleagues, along with recognition of their contributions, plays a vital role in protecting against burnout.

Overall, addressing burnout requires a dual focus on empowering individuals with effective coping skills and implementing systemic workplace improvements to foster well-being, job satisfaction, and quality patient care [4-6].

## CONCLUSION(S)

Burnout is alarming as an occupational health concern in health-care organisations. It is linked with emotional exhaustion, depersonalisation, lower personal accomplishment, physical fatigue, disengagement and cognitive impairment. Predictors such as workload, work environment, occupational relationship, salary and occupational stress are more common for burnout. Due to the non-availability of more national and international studies in the context of burnout of haemodialysis nurses and technicians, the impact of sociodemographic characteristics on burnout is less explored. Burnout of nurses not only reduces professional efficiency, but it also has a negative impact on physical and mental health. Future research should continue to explore the impact of burnout on patient care and innovative measures to prevent burnout for haemodialysis nurses and technicians. Recognising and addressing burnout is not only essential for protecting professionals but also for ensuring the quality and safety of patient care.

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