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WORKLOAD AND WORK PACE AMONG PHYSICIANS IN EGYPTIAN PUBLIC HOSPITALS: A REVIEW OF THE LITERATURE

Yomna Amer

ESLSCA University Egypt, Giza, Egypt
Email: yomnaamer2@yahoo.com
Corresponding Author: Yomna Amer

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ABSTRACT

Physician workload is frequently operationalized through working hours or patient volume, yet these indicators capture only part of the demand imposed by clinical work. Temporal pressure, workflow interruptions, administrative activity, staffing adequacy, and resource constraints can substantially alter the effort required to deliver the same nominal volume of care. This structured narrative review critically synthesizes evidence on physician workload and work pace as conceptually related but analytically distinct dimensions, with specific relevance to Egyptian public hospitals. A structured search strategy was applied to literature published from 2000 through August 2026, using PubMed as the principal biomedical database, targeted searches of authoritative institutional sources, and backward reference chaining for seminal measurement and theoretical literature. Twenty-nine peer-reviewed and official sources were retained for conceptual, empirical, and contextual synthesis. COPSOQ III and Job Demands-Resources theory provided the principal organizing frameworks. Across the evidence base, temporal pressure was consistently measurable: in one prospective study, 67% of clinicians reported insufficient time for new-patient consultations and 53% for follow-up visits, while direct observation of hospital physicians identified 3.66 workflow interruptions per hour. Egyptian studies similarly document substantial occupational strain; at Tanta University Emergency Hospital, 66.0% of participants reported moderate burnout and 24.9% high burnout, with work burden independently associated with burnout. Taken together, the evidence indicates that workload assessment in Egyptian public hospitals should move beyond headcount and patient volume by distinguishing task quantity from temporal intensity and integrating validated physician-reported measures with operational indicators of staffing, workflow, and usable clinical capacity.

KEYWORDS: Physician Workload; Work Pace; Quantitative Work Demands; Time Pressure; Hospital Work Environment; Healthcare Workforce Management; Egyptian Public Hospitals.

1. INTRODUCTION

The capacity of physicians to provide safe and timely care is determined not simply by workforce

headcount, but by the interaction between clinical demand, available time, and organizational capacity. Conventional indicators such as patients per physician or scheduled hours can obscure substantial variation in case complexity, documentation, coordination, supervision, emergency coverage, and task fragmentation. Time-and-motion research illustrates this limitation: a considerable proportion of physicians' working time may be absorbed by electronic records and desk-based activity rather than direct patient care (Sinsky et al., 2016). Workload is therefore better understood as a multidimensional property of the clinical work system than as a simple count of patients or hours.

A critical conceptual distinction concerns quantitative workload and work pace. These constructs are often conflated, although they represent different dimensions of demand. COPSOQ III differentiates quantitative demands—the amount of work relative to the time available—from work pace, which reflects the speed and temporal intensity with which work must be performed (Burr et al., 2019). This distinction is consequential for both measurement and intervention: excessive task volume may indicate insufficient capacity, whereas excessive pace may arise from scheduling compression, bottlenecks, interruptions, or poorly coordinated workflows.

The Job Demands-Resources (JD-R) framework provides a complementary explanation by locating workload within the balance between demands and the resources available to meet them (Bakker & Demerouti, 2017). Staffing, administrative support, equipment availability, information systems, team configuration, and workflow design can either buffer or amplify a given level of clinical demand. From this perspective, physician workload is not solely an individual exposure; it is an emergent characteristic of how work is organized and resourced.

Egyptian evidence points to substantial pressure within physician work environments. At Tanta University Emergency Hospital, a study including 266 physicians and 284 nurses found moderate burnout in 66.0% of participants and high burnout in 24.9%; work burden was among the significant predictors (Abdo et al., 2016). Pandemic-period studies in Egypt likewise documented substantial occupational strain among physicians (Abdelhafiz et al., 2020; Elghazally et al., 2021; Sehsah et al., 2021). Yet direct separation of quantitative workload from work pace remains uncommon in Egyptian research.

Accordingly, this review addresses three questions: (1) how are physician workload and work pace conceptually and empirically differentiated; (2) which measurable organizational conditions generate or intensify these demands; and (3) what implications does the available evidence have for workload measurement, management, and future research in Egyptian public hospitals?

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2. METHODOLOGY

2.1 Review Design and Scope

A structured narrative review design was adopted to integrate heterogeneous forms of evidence—including conceptual frameworks, observational and experimental studies, systematic reviews, validated measurement research, and Egyptian contextual data—without implying the statistical comparability required for meta-analysis. The scope was restricted to physician workload and closely related dimensions: quantitative demands, work pace, time pressure, working-time exposure, workflow interruptions, administrative and digital burden, and organizational resources. Egyptian public and university hospitals constituted the primary context of interest. International evidence was included selectively when it contributed robust measurement approaches, explanatory mechanisms, or empirical findings that were plausibly transferable at the conceptual or methodological level.

2.2 Information Sources and Search Strategy

The literature search was conducted using a structured, targeted strategy covering publications from January 2000 through August 2026, with the final search updated on 12 August 2026. PubMed served as the principal database for peer-reviewed biomedical and health-services literature. Official Egyptian health-system statistics and metadata were retrieved from the Central Agency for Public Mobilization and Statistics (CAPMAS). Backward reference chaining from key papers was used to identify seminal measurement instruments, theoretical contributions, and high-impact empirical studies not captured by the date restriction. Search concepts combined physician- and hospital-related terms with workload, quantitative demands, work pace, time pressure, working hours, interruptions, administrative burden, and Egypt-specific terms. Earlier publications were retained only when they were foundational to construct definition or measurement.

Search domain	Example search concepts	Purpose
Physician workload	physician OR doctor AND workload AND hospital	Quantitative/operational workload
Work pace/time pressure	physician AND (work pace OR time pressure) AND clinical	Temporal intensity
Interruptions	hospital doctors AND workflow interruptions AND workload	Fragmentation of work
Egypt	Egyptian physicians AND (workload OR working hours OR burnout)	Contextual physician evidence

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Official context	CAPMAS health services 2024 doctors	Official Egyptian health-service data

Table 1. Search domains used in the structured narrative review.

2.3 Eligibility and Evidence Selection

Eligibility was determined by direct relevance to at least one prespecified review domain. Included sources comprised peer-reviewed empirical studies, systematic reviews or meta-analyses, validated measurement papers, major theoretical contributions, and authoritative official statistics. Physician-specific evidence was prioritized. Studies of mixed healthcare workforces were retained only when physician data were reported or when the study provided important Egyptian contextual evidence. Sources were excluded when they concerned unrelated occupational groups, lacked a substantive workload, time, workflow, or organizational-demand component, or contributed no interpretable evidence to the review questions. Twenty-nine peer-reviewed or official sources were retained in the final evidence set, including the CAPMAS 2024 health-services dataset. Because the search was designed as a structured narrative review rather than an exhaustive systematic review, PRISMA-style database counts and a formal screening flow diagram are not presented.

2.4 Data Extraction and Synthesis

For each empirical study, data were extracted on setting, population and sample size, study design, workload-related construct, measurement approach, and the principal quantitative finding where explicitly reported. The evidence was then organized into six analytic domains: quantitative workload; work pace and time pressure; workflow interruptions; working-time exposure; administrative and digital workload; and the Egyptian hospital context. Statistical pooling was not undertaken because the included studies differed substantially in populations, settings, designs, constructs, and measurement scales. Synthesis therefore proceeded through structured comparison of effect direction, magnitude where available, measurement method, and the organizational mechanism represented by each finding.

2.5 Evidence Appraisal and Methodological Limitations

Evidence strength was considered in relation to study design, measurement validity, directness to the review question, and contextual relevance. Greater interpretive weight was assigned to direct observational, prospective, experimental, systematic-review, and validated-instrument evidence where appropriate, while Egyptian cross-sectional studies were used primarily to establish local relevance rather than causal inference. International literature was preferentially drawn from established peer-reviewed journals in health services research, internal medicine, occupational health, and quality and safety. No claim is made that every source occupies the same quartile across databases or years, as journal rankings vary by indexing system and category. The principal limitation is inherent

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to the structured narrative design: the review provides a transparent and evidence-led synthesis, but it does not constitute exhaustive retrieval, formal risk-of-bias assessment, or meta-analytic estimation.

3. RESULTS AND DISCUSSION

3.1 Quantitative Evidence: Overview

Study	Setting	Sample	Indicator	Key quantitative finding
Abdo et al., 2016	Egypt; emergency hospital	266 physicians + 284 nurses	Work burden / burnout	66.0% moderate; 24.9% high burnout; work burden significant predictor
Weigl et al., 2012	Hospital medicine/surgery	29 doctors; 43 full shifts	Interruptions / workload	3.66 interruptions/hour; workload association beta=0.22, p=0.03
Prasad et al., 2020	34 primary-care practices	168 clinicians	Time pressure	67% needed more time for new patients; 53% for follow-ups
Sinsky et al., 2016	4 ambulatory specialties	57 physicians	Time allocation	For each hour of direct patient time, nearly 2 hours spent on EHR/desk work during clinic day
ALQahtani et al., 2016	Internal medicine residents	Controlled experiment	Time pressure / accuracy	Diagnostic accuracy lower under imposed time pressure
Elghazally et al., 2021	Assiut University Hospitals	Healthcare professionals	Working time / burnout	>8 working hours/day associated with higher burnout scores

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Table 2. Selected quantitative evidence on physician workload and work pace.

3.2 Reframing Workload Beyond Patient Volume

Across the reviewed literature, workload is most coherently conceptualized as a demand-capacity relationship rather than a simple task count. The relevant question is not only how much work is generated, but whether available time, staffing, and organizational resources are sufficient to complete that work to an acceptable standard. COPSOQ III captures this logic through its quantitative-demands construct (Burr et al., 2019). Consequently, physician workload encompasses both direct clinical encounters and the ancillary work generated around them, including documentation, coordination, communication, and follow-up.

Sinsky et al. (2016) provided a particularly concrete illustration. In a time-and-motion study of 57 physicians across four specialties, physicians spent nearly two additional hours on electronic health records and desk work for every hour of direct clinical face time during the clinic day. This finding shows why patient volume alone can understate physician demand. Shanafelt et al. (2016) similarly linked clerical and electronic-environment burden with professional dissatisfaction and burnout.

Hospitalist evidence also challenges universal workload thresholds. Michtalik et al. (2013) found that perceptions of safe attending workload reflected physician, team, and hospital characteristics as well as patient census. The operational implication is that workload capacity depends on case mix and support structure, not simply headcount.

3.3 Work Pace as Temporal Demand

Work pace represents the temporal intensity of clinical activity: the speed, continuity, and compression with which tasks must be completed. It is analytically distinct from total workload because an identical volume of work may be distributed across a manageable period or concentrated into short, high-pressure intervals. Treating these conditions as equivalent can obscure the mechanism generating strain and lead to poorly targeted interventions.

Prasad et al. (2020) quantified this problem in 168 clinicians across 34 practices. Sixty-seven percent reported needing more time than allotted for new-patient visits and 53% for follow-up visits. Time pressure was especially common among clinicians managing complex psychosocial needs and patients with limited English proficiency. The study therefore links time pressure to both scheduling and patient complexity rather than treating it as a generic feeling of being busy.

Experimental evidence also suggests that temporal compression can influence clinical reasoning. ALQahtani et al. (2016) found lower diagnostic accuracy among internal medicine residents exposed

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to time pressure. This does not mean that every fast-paced shift produces diagnostic error, but it strengthens the argument that work pace deserves independent measurement.

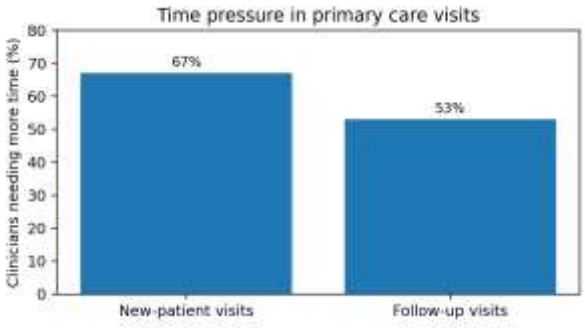

Figure 1. Percentage of clinicians reporting insufficient allotted time for new and follow-up visits (Prasad et al., 2020).

3.4 Workflow Interruptions as a Measurable Source of Workload

Workflow interruptions reduce the continuity of available clinical time and introduce repeated task switching. In a prospective observational study of 29 hospital physicians across 43 complete shifts, Weigl et al. (2012) documented a mean interruption rate of 3.66 per hour. Total interruptions were positively associated with perceived workload ($\beta = 0.22$, $p = .03$), as were interruptions originating from nursing personnel ($\beta = 0.23$, $p = .03$). These findings demonstrate that fragmentation is not merely a subjective complaint; it can be directly observed, quantified, and related to workload.

The numerical rate is important because it converts an abstract complaint into an operational exposure. At 3.66 interruptions per hour, a physician working an eight-hour observed day could encounter roughly 29 interruption events if the rate remained constant; this extrapolation is illustrative rather than a reported study result. The management question is therefore not whether all interruptions should be removed, since many transmit essential clinical information, but which interruptions are avoidable and how communication can be structured to reduce unnecessary task switching.

Other observational work has likewise shown that interruptions are frequent in hospital practice and vary by activity and setting (Weigl et al., 2011). Emergency-department workflow research also demonstrates extensive task switching and competing prompts, reinforcing the importance of temporal fragmentation in high-acuity services.

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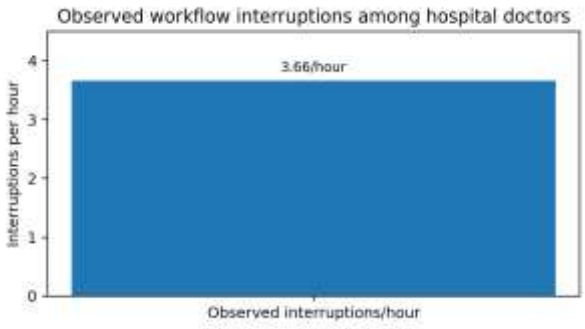

Figure 2. Observed workflow interruption rate among hospital doctors (Weigl et al., 2012).

3.5 Egyptian Evidence: Magnitude and Context

Study	Setting	Sample	Reported quantitative signal	Relevance to workload
Abdo et al., 2016	Tanta University Emergency Hospital	266 physicians + 284 nurses	66.0% moderate burnout; 24.9% high; 39.7% of physicians high emotional exhaustion	Work burden significant in multivariable model
Abdelhafiz et al., 2020	Egypt; physicians during COVID-19	Egyptian physicians	High occupational burnout reported during pandemic	Shows national physician strain under exceptional demand
Elghazally et al., 2021	Assiut University Hospitals	Healthcare professionals	Working >8 hours/day associated with higher burnout	Working-time exposure relevant
Sehsah et al., 2021	Egyptian physicians	Physicians	Substantial psychological distress; frontline/less-experienced groups more affected	Contextual evidence of intensified demand

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Eisa et al., 2025	Egypt; national cross-sectional	Egyptian physicians	Burnout remained measurable in post-acute-pandemic evidence	Indicates continuing workforce concern

Table 3. Egyptian evidence relevant to physician workload and working conditions.

The strongest directly extractable Egyptian workload-related numbers in the reviewed evidence come from the Tanta University Emergency Hospital study. The sample included all 266 physicians in the study frame and 284 nurses. Across participants, 66.0% had moderate burnout and 24.9% high burnout. Among physicians specifically, 39.7% had high emotional exhaustion. Work burden remained a significant predictor in multivariable analysis (Abdo et al., 2016).

These estimates require careful contextual interpretation. They do not represent national prevalence among Egyptian physicians: the study was conducted in a single emergency-hospital setting, and the overall burnout percentages were derived from a combined physician-nurse sample. Their importance lies instead in demonstrating that work burden was measurable within a high-demand Egyptian hospital environment and remained relevant after multivariable adjustment. The findings therefore support local construct relevance without justifying population-wide extrapolation.

CAPMAS's 2024 health-services statistical system provides an important official data infrastructure for future workload research. The published data dictionary includes a dedicated physician file with 31,937 records as well as hospital, clinic, surgery, employment, and salary files. CAPMAS explicitly cautions that record counts in the metadata are not weighted population estimates; accordingly, this review does not treat the 31,937 records as the national number of physicians. The value of the dataset is its potential to connect workforce distribution with facility-level service information in future analyses (CAPMAS, 2025).

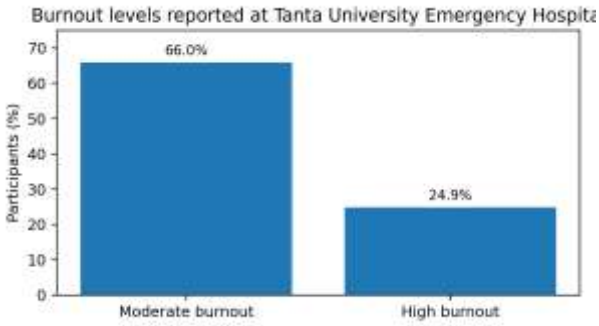

Figure 3. Burnout levels reported among participants at Tanta University Emergency Hospital;

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work burden was a significant predictor (Abdo et al., 2016).

3.6 Working Hours, Administrative Load, and Hidden Capacity

Working hours remain important, but hours alone do not describe intensity. Long duty periods increase exposure to clinical demand and reduce recovery time, while high work pace can make shorter periods extremely demanding. Egyptian evidence from Assiut University Hospitals associated working more than eight hours per day with higher burnout scores (Elghazally et al., 2021). International studies of hospital physicians similarly connect accumulated long shifts and on-call exposure with occupational risk.

Administrative work creates another form of hidden demand. Sinsky et al. (2016) showed that electronic and desk work consumed substantial physician time, while Shanafelt et al. (2016) linked clerical burden with professional outcomes. These studies were conducted outside Egypt, so their exact percentages should not be transferred to Egyptian hospitals. Their mechanism, however, is directly testable locally: hospitals can measure how much physician time is spent on documentation, forms, duplicate entry, approvals, and non-clinical coordination.

The practical implication is that effective physician capacity is smaller than scheduled clinical hours whenever a substantial share of those hours is consumed by necessary but non-patient-facing work. Workforce planning should therefore distinguish nominal staffing from usable clinical time.

3.7 Integrative Synthesis: Four Workload Profiles

Workload profile	Interpretation	Likely management response
Low volume / manageable pace	Adequate capacity	Routine monitoring
High volume / manageable pace	Large task load but temporal flexibility	Staffing, task distribution, capacity planning
Moderate volume / high pace	Demand concentrated in peaks or bottlenecks	Scheduling, patient flow, interruption control
High volume / high pace	Simultaneous excess task load and temporal compression	Combined staffing + workflow intervention

Table 4. Demand-capacity profiles derived from the distinction between workload and work pace.

The evidence becomes more operationally informative when quantitative demand and work pace are considered jointly rather than collapsed into a single notion of being 'busy.' Four broad demand-capacity profiles can be distinguished. High volume with manageable pace primarily signals a capacity

or task-distribution problem; moderate volume with high pace is more consistent with temporal concentration, scheduling, or flow constraints; and concurrent high volume and high pace represents the most exposed condition because excessive task quantity coincides with limited temporal flexibility.

This framework also explains why a single intervention can fail. Adding physicians may reduce patient load but leave work pace unchanged if bottlenecks, interruptions, or documentation remain. Conversely, process redesign can improve pace but cannot compensate indefinitely for a genuine shortage of clinical capacity.

3.8 Management Implications for Egyptian Public Hospitals

A practical workload dashboard for Egyptian public hospitals should combine a small number of physician-reported and operational measures. Physician-reported indicators can include COPSOQ III quantitative demands and work pace. Operational indicators can include actual hours worked, on-call frequency, patients per shift, admissions and discharges, peak-period demand, staffing gaps, interruption frequency, and time spent on documentation or administrative tasks.

The dashboard should be analyzed at department and shift level rather than only hospital-wide. Average monthly patient volume can hide repeated overload during emergency peaks, outpatient clinic sessions, ward rounds, or discharge periods. Similarly, physician headcount can overstate capacity where staff divide time among clinical care, teaching, supervision, administration, or multiple facilities.

Management interventions should follow the identified mechanism. Persistent excess volume supports staffing or redistribution decisions. High work pace concentrated in predictable periods supports scheduling and patient-flow redesign. Excessive interruptions support communication and escalation redesign. Administrative overload supports task redistribution and simplification. Digital tools should be evaluated according to whether they actually release physician time rather than simply adding another documentation layer.

The Egyptian evidence base would benefit from prospective multicenter studies that pair validated physician-reported workload measures with hospital operational data. This would allow researchers to move from broad descriptions of pressure toward specific estimates of where workload is generated and which interventions change it.

3.9 Evidence Gaps and Priorities for Research

Three evidence gaps are particularly consequential. First, Egyptian studies rarely distinguish

quantitative demands from work pace using validated multidimensional instruments. Second, the local evidence base is concentrated in specific institutions and, in several studies, exceptional pandemic conditions, which limits inference across hospital types, specialties, and governorates. Third, physician-reported workload is seldom linked to objective operational indicators such as patient flow, actual working hours, interruption frequency, staffing by shift, or documentation time. These limitations constrain both causal interpretation and the design of targeted management responses.

Future research should therefore compare public hospital types, specialties, career stages, and geographic settings; use repeated or longitudinal measurement; and evaluate interventions rather than only describing problems. CAPMAS health-services data provide an official contextual resource, but facility-level workload research will still require primary organizational and physician-level data.

The goal should not be to eliminate demanding work from medicine. Rather, research should identify when necessary clinical demand becomes amplified by avoidable organizational burden and when demand exceeds sustainable capacity.

3.10 Specialty and Career Stage as Sources of Workload Variation

Simple workload metrics implicitly assume that a patient or an hour represents a comparable unit of work across specialties. That assumption is rarely defensible. Clinical services differ in acuity, procedural intensity, unpredictability, documentation requirements, coordination demands, emergency exposure, and the frequency of high-stakes decisions. Consequently, an emergency physician, an acute-care surgeon, an inpatient internist, and an outpatient specialist may each experience high workload through structurally different demand profiles. Universal workload thresholds can therefore create misleading comparisons unless case mix and service configuration are considered.

Career stage introduces another layer of variation. Junior physicians may need more time for clinical reasoning, documentation, consultation, and verification, while senior physicians often carry supervisory, teaching, escalation, and management responsibilities in addition to direct clinical care. Seniority can therefore reduce the time required for some tasks while adding other forms of workload that are invisible in-patient counts. In teaching hospitals, the work of supervising and correcting clinical decisions can be substantial even when it is not recorded as a separate service activity.

This issue is especially relevant to Egyptian university hospitals because service delivery, postgraduate training, undergraduate education, research, and supervision frequently coexist. A physician's nominal clinical schedule may therefore represent only part of the actual workload. If workforce planning counts the physician as fully available for patient care without accounting for

these responsibilities, effective clinical capacity can be overstated.

The international literature supports contextual interpretation. Michtalik et al. (2013) found that perceptions of safe hospitalist workload reflected team and hospital characteristics in addition to patient census. Yu et al. (2022) similarly showed that attending-physician work hours varied with organizational and hospital characteristics after adjustment for individual factors. Together, these findings suggest that workload should be benchmarked within comparable clinical and organizational settings rather than against a single hospital-wide target.

A stronger Egyptian workload study should therefore stratify results by specialty, grade, and hospital function. At minimum, residents, specialists, consultants, and academic faculty should not automatically be combined into one physician category. Their exposure to night duty, direct patient volume, supervision, administrative responsibility, and decision complexity can differ substantially. Stratification would also help identify whether high workload is concentrated among early-career physicians or distributed across the professional hierarchy.

Specialty-sensitive measurement also matters for management intervention. A surgical service may require changes in theatre scheduling, perioperative coordination, or emergency coverage; an outpatient service may require appointment redesign; an emergency department may require peak-demand staffing and interruption control. Describing all three situations as 'physician workload' is accurate but operationally incomplete.

3.11 Integrating Objective and Subjective Workload Measures

Physician workload can be assessed using objective indicators, subjective instruments, or integrated approaches. Objective indicators include scheduled and actual hours, patients per shift, admissions, discharges, procedures, messages, documentation time, on-call frequency, and task counts. Their strength lies in operational visibility and longitudinal comparability; their weakness is that they may fail to capture complexity, cognitive load, interruptions, simultaneity, or the adequacy of time available for task completion.

Subjective measures capture the physician's assessment of the demand-capacity relationship. COPSOQ III is particularly useful because it separates quantitative demands from work pace (Burr et al., 2019). This separation allows two departments with similar patient volume to be distinguished if one requires a substantially faster pace. NASA-TLX and related instruments provide another multidimensional approach and have been used across healthcare environments to assess mental, temporal, and effort-related workload. Hertzum's (2021) meta-analytic review demonstrates that healthcare workload is sufficiently heterogeneous to justify multidimensional rather than single-item

assessment.

For hospital management, the strongest measurement strategy is likely to be hybrid. High physician-reported quantitative demands may coincide with objectively excessive patient volume, supporting a capacity response. Alternatively, comparable subjective demand may occur despite moderate patient numbers when documentation, interruptions, or coordination consume substantial time, indicating a process problem. Subjective measures identify that the demand-capacity balance is being exceeded; operational measures help identify the mechanism responsible.

Hybrid measurement also protects against a common management error: assuming that subjective workload is merely perception and that objective volume is the 'real' measure. Perceived workload can reflect dimensions that routine information systems do not capture, including cognitive switching, uncertainty, emotional demands, and the need to complete several tasks simultaneously. Conversely, subjective ratings alone cannot tell managers whether the cause is staffing, scheduling, workflow, or task allocation. Both perspectives are therefore necessary.

For Egyptian public hospitals, a feasible measurement package could remain short. A brief physician survey could include COPSOQ III quantitative-demands and work-pace items. Routine operational data could add actual hours, patients per clinical period, admissions, discharges, staffing gaps, and on-call frequency. Selected services could periodically measure interruptions and documentation time. This would produce a richer workload profile without creating a large new reporting burden.

The unit of analysis should also be explicit. Patient volume per day, per shift, per physician, per clinical hour, or per full-time equivalent can produce different conclusions. Physician headcount is particularly problematic when doctors divide time among clinical care, teaching, administration, research, or more than one workplace. Workload research should therefore report the denominator and explain what portion of physician time is genuinely available for the activity being measured.

Aggregation presents a similar challenge. Hospital-wide averages can conceal local overload. A facility may appear adequately staffed while an emergency unit, intensive-care service, or high-volume clinic repeatedly exceeds capacity. Department- and shift-level analysis should therefore precede hospital-wide aggregation. The objective is to identify where and when demand exceeds capacity rather than simply calculate an institutional average.

3.12 Patient Complexity, Case Mix, and Workload Interpretation

Patient volume is attractive as a workload indicator because it is easy to count, but it assumes that each encounter generates comparable work. In practice, physician effort varies with acuity,

multimorbidity, diagnostic uncertainty, communication needs, procedural complexity, and the extent of coordination required across services. A single complex admission may therefore consume more physician time and cognitive effort than several stable follow-up encounters, making unadjusted patient counts an incomplete proxy for workload.

Time-pressure evidence illustrates this effect. In the study by Prasad et al. (2020), clinicians caring for larger numbers of patients with complex psychosocial needs or limited English proficiency were more likely to report insufficient time. The numerical patient count therefore did not fully explain temporal demand; patient characteristics changed the amount of work required within the same appointment structure.

Case mix also affects hospital throughput. Complex patients may require more investigations, consultations, documentation, and discharge coordination. When these activities depend on other departments, the physician's workload becomes partly determined by system responsiveness. Delays can generate repeated follow-up tasks, calls, and reassessments, increasing workload without increasing the number of unique patients.

For Egyptian public hospitals, case complexity should be considered particularly in tertiary referral and university settings. These facilities often receive patients who require specialized assessment, multidisciplinary input, or management after referral from other facilities. Comparing their patient-to-physician ratios directly with lower-acuity settings could therefore produce misleading conclusions about workload adequacy.

A practical solution is not necessarily a sophisticated case-mix index in every hospital. Even simple stratification by emergency versus scheduled care, new versus follow-up patients, inpatient acuity, procedure type, or referral complexity can improve interpretation. The essential principle is that patient numbers should be treated as workload inputs rather than complete workload measures.

3.13 Administrative and Digital Work as Capacity Consumption

The expansion of documentation and digital systems has made administrative workload increasingly visible in physician research. Sinsky et al. (2016) demonstrated that physicians spent extensive time on electronic records and desk work, while Shanafelt et al. (2016) linked clerical burden and characteristics of the electronic environment with professional dissatisfaction and burnout. These studies are not Egyptian and their exact time ratios should not be assumed locally, but they establish a mechanism that can be measured directly in Egyptian hospitals.

3.13 Administrative and Digital Work as Consumption of Clinical Capacity

Administrative and digital activity constitutes a material component of physician workload because it consumes time that might otherwise be available for direct clinical care. Sinsky et al. (2016) quantified substantial electronic-record and desk-work time, while Shanafelt et al. (2016) associated clerical burden and characteristics of the electronic environment with adverse professional outcomes. These estimates should not be imported directly into Egypt; rather, they establish a measurable mechanism that warrants local investigation.

This is highly relevant to Egyptian health-system modernization. As public facilities expand digital processes, implementation evaluation should include physician time. A digital project can meet technical implementation targets while still reducing usable clinical capacity if it transfers data-entry work to physicians or creates parallel processes. Time saved or added per clinical episode is therefore a meaningful implementation outcome.

Task allocation is another important issue. Some administrative or coordination tasks may be safely performed by appropriately trained administrative, nursing, or allied staff. When such work is routinely transferred to physicians because supporting roles are unavailable, the system consumes scarce medical capacity. Workforce planning should therefore examine team composition, not only physician numbers.

An Egyptian workload study could quantify this domain through short time-motion samples or electronic timestamps. Even a one-week observation in selected departments could estimate the proportion of physician time spent on direct care, documentation, coordination, waiting, and other activities. Repeating the measurement after process redesign would provide stronger evidence than relying on general perceptions of administrative burden.

3.14 International Evidence: What Can and Cannot Be Transferred to Egypt

International studies are valuable because they provide validated measures, observational methods, and examples of quantifiable workload mechanisms. However, effect sizes and operational thresholds should not be transferred mechanically to Egyptian public hospitals. Health systems differ in financing, staffing models, professional roles, documentation, referral pathways, technology, and patient expectations. The same numerical workload can therefore have different practical meaning across settings.

The evidence on electronic documentation illustrates this distinction. Sinsky et al. (2016) quantified EHR and desk work in US ambulatory practice. The exact ratio reflects a specific documentation environment and cannot be presented as an Egyptian estimate. What is transferable is the research question: how much physician time is consumed by non-face-to-face work, and which tasks could be

redesigned? Local measurement is needed to answer it.

3.14 Transferability of International Evidence to Egypt

International studies offer validated constructs, measurement strategies, and evidence on workload mechanisms, but their numerical estimates and operational thresholds cannot be assumed to apply directly to Egyptian public hospitals. Health systems differ in staffing models, financing, professional roles, documentation requirements, referral pathways, technology, and patient expectations. Transferability is therefore strongest at the level of construct and method, while prevalence, thresholds, and effect magnitude require local estimation.

The JD-R framework is also best transferred at the level of mechanism rather than numerical prediction. Demands consume effort and resources help employees meet those demands (Bakker & Demerouti, 2017). The critical resources in one Egyptian hospital may be staffing, while another may be constrained primarily by equipment, administrative processes, referral coordination, or information systems. Local evidence is needed to identify which resources matter most.

Pandemic-era Egyptian studies require a different caution. They provide locally grounded evidence but were conducted during an exceptional period of demand, uncertainty, and infection risk. Their findings should therefore not be treated as estimates of ordinary workload. They remain valuable because they show how working hours, frontline exposure, and organizational conditions behave when capacity is severely challenged.

A strong evidence strategy for Egypt should therefore combine international methodological strength with local contextual measurement. International research can define constructs, suggest instruments, and identify mechanisms. Egyptian studies must establish prevalence, distribution, and operational causes within the national hospital system.

3.15 From Measurement to a Workload Governance Cycle

The evidence supports treating workload as a routine governance issue rather than an episodic complaint. A practical governance cycle can be organized around four activities: measurement, diagnosis, targeted intervention, and evaluation. Each activity addresses a common reason why workload initiatives fail when implemented without a clear model.

Measurement makes the problem visible. Hospitals need a limited set of indicators that clinical and administrative leaders can interpret. These may include actual working hours, on-call exposure, patient volume, peak demand, staffing gaps, after-hours documentation, interruption frequency, and brief physician-reported measures of quantitative demands and work pace. The purpose is not to create

another reporting burden; it is to generate enough evidence to distinguish persistent overload from temporary variation.

3.15 From Measurement to Workload Governance

The synthesis supports treating physician workload as a routine governance variable rather than an episodic complaint. A defensible governance cycle comprises four linked functions: measurement, diagnosis, targeted intervention, and evaluation. Measurement establishes the pattern and location of demand; diagnosis identifies the mechanism generating it; intervention is selected to match that mechanism; and evaluation determines whether the intervention altered the intended workload indicator without displacing burden elsewhere.

Evaluation completes the cycle. A workload intervention should demonstrate that it changed the intended indicator. For example, a digital tool designed to reduce documentation should reduce physician documentation time; a staffing intervention should reduce patients per physician or excessive hours; a scheduling intervention should reduce peak time pressure. Without before-and-after measurement, an intervention may merely shift workload to another time or professional group.

Organization-directed evidence supports this approach. Panagioti et al. (2017) and West et al. (2016) found that organizational interventions can reduce physician burnout, although burnout is not identical to workload. The relevance here is that changing the work system can alter occupational outcomes. Workload governance applies the same principle earlier in the causal chain by targeting the demands and resources that structure daily work.

A pilot approach would be realistic for Egyptian public hospitals. High-demand departments such as emergency services, high-volume outpatient clinics, and major referral wards could test a compact dashboard for several months. The pilot could establish feasible indicators, data availability, and local thresholds before wider adoption. This would be more credible than attempting immediate national standardization without facility-level evidence.

Governance also creates a common language. Physicians may describe overload through experience, while managers may rely on headcount or patient totals. A shared set of workload and work-pace indicators allows both perspectives to be examined together. Disagreement can then focus on data interpretation and intervention rather than on whether workload is 'real.'

3.16 Policy Implications for the Egyptian Physician Workforce

At policy level, physician workload should be integrated into workforce planning rather than confined to occupational-health discourse. Aggregate physician numbers are necessary but insufficient

indicators of effective capacity. Service capacity also depends on geographic and specialty distribution, allocation of physician time, clinical role, team composition, and the organizational resources available within facilities. Workforce planning that ignores these dimensions risks equating nominal headcount with usable clinical capacity.

Distribution is therefore as important as aggregate supply. A national increase in physician numbers may have limited effect on workload if capacity remains concentrated geographically or by specialty. Facility-level workload data can identify where workforce gaps translate into operational overload and where the dominant problem is process rather than headcount.

The CAPMAS 2024 health-services dataset is potentially valuable in this regard because its metadata show dedicated physician, clinic, hospital, surgery, employment, and salary files. The physician file contains 31,937 records in the metadata, but CAPMAS warns that such record counts are not weighted population estimates. The correct use of these data is therefore analytical rather than rhetorical: researchers should examine documented variables and weighting rules before deriving national workforce statistics.

Policy should also recognize the opportunity cost of physician time. When physicians perform tasks that could be completed safely by other trained staff, the health system loses scarce clinical capacity. Team design, administrative support, and scope-of-work decisions therefore belong within workforce policy, not only hospital operations.

Digital-health policy should include workload impact as an implementation criterion. Systems should be assessed for clinician time requirements as well as technical functionality and data completeness. A platform that improves reporting but creates duplicate entry may reduce effective clinical capacity. Measuring physician time before and after implementation would make this trade-off visible.

Finally, workload policy should distinguish necessary clinical intensity from avoidable organizational burden. Public hospitals will always contain urgency, uncertainty, and periods of high demand. The realistic objective is not to make medical work undemanding; it is to prevent unnecessary process friction from consuming the capacity required for necessary clinical work.

3.17 An Evidence Framework for Future Egyptian Studies

Future Egyptian physician-workload research should move beyond single-outcome cross-sectional surveys toward designs that integrate validated physician-reported measures with operational hospital data and explicit sampling across hospital types. Such an approach would permit direct comparison between perceived demand and measured service conditions, improving both explanatory precision

and managerial relevance.

The physician survey should measure quantitative demands and work pace separately. It could also record specialty, grade, department, scheduled and actual hours, on-call frequency, and major non-clinical responsibilities. Operational data could include patient arrivals, admissions, discharges, staffing by shift, clinic schedules, bed occupancy where relevant, and selected measures of documentation or interruption burden.

Sampling should reflect the heterogeneity of the public system. University hospitals, teaching hospitals, general public hospitals, specialized facilities, and geographically diverse governorates should not be assumed to have the same workload structure. Stratification would allow researchers to identify whether the same workload score represents different operational realities.

A repeated-measures design would be especially valuable. Measuring the same department during ordinary periods and peak-demand periods could separate chronic workload from temporary surges. Similarly, measurement before and after staffing changes, workflow redesign, or digital implementation could generate stronger causal evidence than cross-sectional association alone.

Quantitative analysis should preserve the distinction between workload and work pace. Treating them as separate dependent or explanatory variables would allow researchers to test whether staffing primarily predicts quantitative demands while interruptions or scheduling primarily predict pace. Interaction analysis could then examine whether the combination of high workload and high pace identifies particularly vulnerable services.

Qualitative work can complement these measures by explaining why the numbers occur. Interviews or focused observations could identify hidden tasks, informal workarounds, delays, and coordination problems that routine systems do not capture. The purpose of qualitative evidence would not be to replace measurement but to explain the mechanisms behind measured patterns.

The final objective should be actionable evidence. A study that concludes only that physicians are 'stressed' offers limited guidance to managers. A study showing that a department has high quantitative demands because of staffing gaps, high work pace because of two predictable arrival peaks, and substantial after-hours documentation because of duplicate processes provides a direct basis for intervention.

3.18 Appraising the Strength and Meaning of the Evidence

The reviewed evidence should be interpreted hierarchically rather than treating all numerical findings

as equivalent. Direct observational studies are particularly informative for workload research because they quantify what physicians actually do during clinical work. Weigl et al. (2012), for example, observed complete shifts and measured interruptions directly, while Sinsky et al. (2016) used time-and-motion methods to quantify physician time allocation. Such designs reduce reliance on retrospective recall and make otherwise hidden components of workload visible.

Prospective and experimental studies answer different questions. Prasad et al. (2020) prospectively examined time pressure across multiple practices, while ALQahtani et al. (2016) experimentally manipulated time pressure to examine diagnostic performance. The former provides stronger evidence about the prevalence and correlates of insufficient time in real clinical practice; the latter provides stronger evidence that temporal pressure itself can influence performance under controlled conditions. Neither design alone is sufficient to describe Egyptian public hospitals, but together they strengthen the conceptual case for measuring pace independently.

Cross-sectional Egyptian studies provide essential local context but have more limited causal interpretation. Associations between work burden, long working hours, distress, and burnout cannot establish that workload alone caused the reported outcomes. Reverse causation, unmeasured organizational factors, and exceptional pandemic conditions may contribute. For this reason, the present review uses these studies to establish the presence and relevance of demanding working conditions rather than to make causal claims that the designs cannot support.

Systematic reviews and meta-analyses provide broader evidence but can also combine heterogeneous definitions of workload and occupational strain. Their value in this paper is mainly to show that organization-level conditions and interventions matter across settings. They do not replace the need for construct-specific Egyptian measurement. The strongest future evidence would triangulate validated surveys, direct observation, operational data, and longitudinal change within the same hospitals.

The review also distinguishes statistical significance from managerial significance. A statistically significant association can be small, while an operationally meaningful workload problem can exist even when a study lacks power to demonstrate significance. Managers need effect magnitude, frequency, duration, and location of demand. For example, an interruption rate of 3.66 per hour is directly interpretable operationally even before considering its regression coefficient with perceived workload.

Similarly, prevalence percentages require an appropriate denominator and setting. The Tanta figures of 66.0% moderate and 24.9% high burnout refer to the study participants, not to all Egyptian

physicians. The Prasad percentages refer to clinicians in 34 primary-care practices, not hospital doctors internationally. Keeping these denominators explicit prevents numerical evidence from becoming misleading when transferred into a different context.

This evidence hierarchy has an important implication for the present review. Numbers are included where the source explicitly reports them and where they illuminate workload or work pace. They are not combined into a pooled Egyptian prevalence because the studies use different populations, instruments, settings, and outcomes. A visually attractive graph is useful only when the quantities being compared are genuinely comparable; otherwise, separate figures and evidence tables are more academically defensible.

Accordingly, the figures in this article serve three distinct purposes rather than pretending to form one common scale: Figure 1 shows reported insufficiency of allotted clinical time, Figure 2 shows directly observed interruption frequency, and Figure 3 shows workload-related strain in an Egyptian emergency-hospital sample. Their combination illustrates the multidimensional character of workload while preserving the original meaning of each measure.

3.19 Translating Evidence into a Hospital Workload Dashboard

A practical implication of the synthesis is the feasibility of translating the literature into a parsimonious hospital workload dashboard. Rather than attempting to capture every feature of physician work, the dashboard should answer three analytically distinct questions: how much work is generated, how temporally compressed that work becomes, and what organizational resources are available to absorb it. This structure preserves the distinction between demand, pace, and capacity while remaining usable for routine management.

For quantitative demand, candidate indicators include patients per physician per shift, admissions and discharges, actual hours worked, on-call frequency, unfinished tasks at shift end, and the COPSOQ III quantitative-demands score. For work pace, hospitals can use the COPSOQ III work-pace score, peak patient-arrival rates, average appointment spacing, frequency of interruptions, and the proportion of clinical time occurring during defined high-demand periods. These indicators should be interpreted together rather than converted into a single composite score before their relationships are understood.

Resource indicators should include physician and nursing staffing by shift, administrative support, availability of essential equipment, and selected measures of process delay. A department with high workload and high staffing may have a workflow problem; a department with high workload and persistent staffing gaps may have a capacity problem. Including both demand and resource measures prevents the dashboard from becoming a simple productivity-monitoring tool.

The dashboard should also protect against perverse incentives. If managers monitor only patients per physician, clinicians may be pressured to increase throughput even when case complexity rises. If only hours are monitored, work may become more intense within shorter shifts. If only physician perceptions are monitored, managers may lack information about the operational mechanism. Balanced measurement is therefore necessary to avoid improving one indicator while worsening another.

Data should be reviewed over time rather than interpreted from a single month. A three- to six-month baseline would help identify normal variation and recurring peaks. Departments could then define local escalation thresholds, such as repeated excessive actual hours, persistent high work-pace scores, or recurrent demand peaks that exceed planned staffing. Thresholds should initially guide investigation rather than automatic punitive or performance action.

Finally, physician workload data should be used for service improvement, not individual surveillance. The analytical unit should primarily be the service, shift, or workflow. This orientation is consistent with the evidence reviewed here, which repeatedly shows that workload emerges from interactions among demand, time, staffing, interruptions, and organizational design. A dashboard built around those interactions would provide a practical bridge between academic evidence and hospital management.

4. CONCLUSION

Physician workload and work pace are closely related but analytically distinct dimensions of clinical work. Quantitative workload reflects the volume and complexity of tasks relative to available capacity, whereas work pace captures the speed and temporal concentration with which those tasks must be completed. Evidence from time-allocation, time-pressure, interruption, and working-time studies demonstrates that both dimensions can be operationalized and measured rather than treated as undifferentiated occupational pressure.

The Egyptian evidence base establishes the relevance of work burden and extended working time but remains insufficiently granular for robust hospital-level workload governance. The immediate research and management priority is therefore not simply to document that physicians experience pressure, but to identify where demand exceeds capacity and why. This requires combining validated physician-reported measures with department- and shift-level operational data and evaluating whether targeted staffing, scheduling, workflow, or administrative interventions change the underlying workload mechanism.

A more precise evidence base would reposition physician workload from a broad expression of

occupational strain to a measurable organizational variable. For Egyptian public hospitals, that shift would strengthen workforce planning, improve the allocation of scarce physician time, and provide a more defensible basis for designing and evaluating interventions intended to sustain clinical capacity.

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