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DOPO L'USCITA DAL PIANO DI RIENTRO

Più soldi per occupazione e territorio

l'editoriale di Teresa Rea

Long term care emergency

Infermieri in prima linea

Noi l'abbiamo già scritto nel nostro Codice deontologico: Il tempo di cura è tempo di relazione. Un assunto morale, prima ancora che un paradigma scientifico-metodologico di derivazione olistica. Con esso gli infermieri ribadiscono la Centralità della Persona e dei sui diritti, rafforzando la tutela dei soggetti fragili e vulnerabili, garantendo dignità e non discriminazione, indipendentemente da età, etnia, religione o orientamento sessuali. Grazie a specifici percorsi formativi di altissimo livello gli infermieri sono da tempo autorevolmente individuati come i responsabili dell'assistenza infermieristica, generale e specialistica, dotati di autonomia professionale e competenze scientifiche ai fini della prevenzione, della cura, della riabilitazione e dell'educazione sanitaria. Ma è l'articolo 4 che qui interessa più di tutti. In osservanza di esso, l'infermiere crea una relazione terapeutica basata sull'empatia, fondamentale nel processo di cura. Soprattutto con i pazienti fragili, anziani e con più patologie cronico-degenerative. L'infermiere si fa garante che la persona assistita non venga mai lasciata in stato di abbandono. Viene sancito appunto, che "il tempo di cura è tempo di relazione", valorizzando la componente comunicativa e umana. Non è un caso se la Missione 6 del Pnrr italiano, interamente dedicata alla salute, individua nell'infermiere l'attore principale per rafforzare il Servizio Sanitario Nazionale attraverso investimenti su assistenza territoriale, strutture per reti di prossimità, Case della Comunità, assistenza domiciliare, telemedicina. Con questa consapevolezza oggi gli infermieri si possono, anzi si devono, candidare ad affrontare la più grande delle emergenze annunciata di recente dall'Ocse. L'organizzazione con sede a Parigi lo ha detto chiaro: l'assistenza agli anziani potrebbe far saltare i sistemi welfare di buona parte dei paesi Ocse. Secondo gli analisti infatti la spesa per la long-term care è destinata a raddoppiare entro il 2050. Mettendo così in ginocchio l'intero sistema di cure e assistenza. Ne parliamo diffusamente in alcuni servizi all'interno. Ma l'argomento è talmente cruciale da rappresentare per noi infermieri una sfida epocale che merita più di una riflessione. L'invecchiamento della popolazione ci pone oggi sfide di sostenibilità dei sistemi sanitari, sia per la cura che per l'assistenza. Un numero sempre crescente di anziani con malattie croniche e ridotta autonomia bussa alle nostre porte, chiedendo assistenza h24, una presa in carico di sistema e non a spot assistenziali, dignità di cure e rispetto della persona. È pari, pari, il profilo professionale degli infermieri. Vale a dire, non c'è altra professione sanitaria in grado di affrontare al meglio questa situazione. Sia per preparazione accademico-scientifica, sia per attitudine professionale. Ma ci sono oggi le condizioni perché la nostra professione assuma su di se un tale onere e tanta, tanta responsabilità? Si, credo io. A patto però che prima di tutto la politica trasformi le scelte in atti concreti: fino a oggi sono stati reclutati solo circa 7.000 infermieri, con forti differenze tra le Regioni. In Campania, ad esempio, sulle 143 strutture di prossimità previste, di cui 88 Case di Comunità, 32 Centrali Operative e 23 Ospedali di Comunità solo 50 sono completate, e 1 hospice sui 10 previsti. Poi bisogna affrontare da subito alcune questioni che noi infermieri poniamo da tempo ma che restano irrisolte. Vediamo quali. Tutto deve partire dalla valorizzazione delle competenze e dalla diversificazione dei modelli organizzativi, per arrivare sempre più vicini al cittadino. Le Case di comunità dovrebbero diventare il centro della rete territoriale, collegate con medici di medicina generale, pediatri, specialisti, farmacie dei servizi e Rsa, anche tramite telemedicina e sanità digitale. In questo modo si costruirebbe una vera sanità di prossimità, in cui il cittadino viene seguito in modo continuo e integrato.

Bisogna poi riorganizzare i percorsi di cura. L'idea è quindi quella di spostare i pazienti cronici dentro percorsi strutturati, in cui non rientrano continuamente nelle liste d'attesa per ogni controllo, ma vengono seguiti in modo organizzato e programmato. Anche in questi percorsi un ruolo importante deve essere svolto dagli infermieri, ad esempio nella gestione di ambulatori per diabete, scompenso cardiaco, medicazioni avanzate o controlli specialistici. Questo permetterebbe di differenziare la risposta ai vari bisogni di salute e ai cittadini con problemi acuti di accedere più facilmente alle prestazioni, migliorare la prevenzione e restringere al massimo i tempi della non autosufficienza, unico vero antidoto contro l'emergenza welfare lanciata dall'Ocse.

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In questo numero

L'EDITORIALE di Teresa Rea 3

Long term care emergency
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"L'invecchiamento della popolazione ci pone oggi sfide di sostenibilità dei sistemi sanitari, sia per la cura che per l'assistenza. Un numero sempre crescente di anziani con malattie croniche e ridotta autonomia bussa alle nostre porte, chiedendo assistenza h24, una presa in carico di sistema e non a spot assistenziali, dignità di cure e rispetto della persona. "

In primo piano 6-7

Più soldi per la sanità, Rea: «Bene ma ora più infermieri» 6
Premiata l'ASL Napoli 2 e la Federico II 7

Politica Sanitaria 8-17

Fico: "Manterrò l'interim alla sanità ancora a lungo" 8
Il Ministero dà l'ok, dopo 19 anni Campania fuori dai vincoli di spesa 8
Lettera aperta al presidente Roberto Fico
L'Opi Napoli al Governatore: "Più assunzioni, più territorio" 10
La Campania spende più di tutti in medicinali 11
Autonomia differenziata
Via libera ai preliminari, Mezzogiorno a rischio 12
FONDO SANITARIO NAZIONALE
Crescono le risorse al Sud, previste 7mila assunzioni 13
Maglia nera alla Campania
Il gap digitale frena screening e prevenzione 14
IL MINISTRO SCHILLACI A NAPOLI
«Inaccettabile che le cure dipendano dal Cap di residenza» 14
Nuove lauree per gli infermieri
La ministra Bernini ha firmato i decreti 16
Aggressioni a operatori sanitari
Più di 18mila episodi, 2025 l'annus horribilis 17

OpiNapoli informa 18-23

I "camici bianchi" uniscono le forze 18
Dirigenti delle professioni sanitarie
Inattuata la norma regionale dell'agosto 2025 19
Una Consulta permanente dei Cittadini e dei Pazienti 20
COORDINAMENTO OPI CAMPANIA
La presidente Rea eletta Coordinatrice regionale 21
Long term care
L'allarme OCSE, alle porte un'emergenza assistenziale 22
Che fine ha fatto la riforma? 23

Ospedale e Territorio 24-29

L'AORN Santobono-Pausilipon
diventa ente nazionale di ricerca 24
Ospedale Cardarelli, nuova Medicina di Urgenza e Utic 25
Ad Acerra l'ambulatorio popolare "San Giuseppe Moscati" 26
Ospedale Avellino, a breve nuovo pronto soccorso 26
Ospedale Frattamaggiore,nuovi reparti, più servizi 28
Ospedale del mare, mastectomia endoscopica nipple-sparing 28
Pascale, individuato il "motore" dell'aggressività del cancro 29

NSC - Supplemento di ricerca infermieristica 30-166

Self-care knowledge, behavioral practices, and preventive strategies for diabetic foot ulcers among individuals with diabetes in tertiary hospitals in nigeria: a cross-sectional study 30
The Impact of Nurse Manager Leadership Styles on Nurse Job Satisfaction: A Cross-Sectional Study at Hamad Medical Corporation, Qatar 61
Exploring the impact of Nurse Manager Leadership Styles on Nurses' Job Performance at Hamad Medical Corporation: A Cross-Sectional Study 88
Competencies of Nursing Tutors in Clinical Training: A Nationwide Italian Survey Protocol 115
Local experience of coordination in robotic surgery: organizational reflections 131
Nurse-led intervention on knowledge and awareness regarding chronic kidney disease among hypertensive and/or diabetic patients: A quasi-experimental study 145
Knowledge and Attitudes of the Role of Artificial Intelligence in Healthcare among Undergraduate Nursing Students in the Northeast of Pakistan:A Descriptive Cross-Sectional Study 166

In primo piano

Più soldi per la sanità, Rea: «Bene ma ora più infermieri»

Il primo atto della giunta regionale dopo l'uscita dal piano di rientro. Alzato di 62 milioni il tetto di spesa. Il governatore Fico "Ho dato mandato alla Direzione Generale per la Tutela della salute di procedere al riparto di 98 milioni di euro per il reclutamento del personale per il potenziamento dell'assistenza sanitaria territoriale". Attivate 16 nuove case di comunità. Controlli nelle strutture sanitarie, ok alle ispezioni tra pubblico e privati accreditati. La presidente Opi Napoli: accolte alcune nostre priorità, ma servono più assunzioni, una nuova governance e valorizzazione della professione.

di Pino de Martino

"Ho dato mandato alla Direzione Generale per la Tutela della salute di procedere al riparto di 98 milioni di euro per il reclutamento del personale per il potenziamento dell'assistenza sanitaria territoriale", ha annunciati il Governatore. Le risorse, assegnate nell'ambito delle misure nazionali di potenziamento del Servizio sanitario, sono finalizzate alla copertura dei maggiori oneri derivanti dall'assunzione di personale, sia dipendente sia convenzionato, anche in deroga ai vincoli di spesa previsti dalla normativa vigente. L'intervento è funzionale all'attuazione del nuovo modello organizzativo dell'assistenza territoriale, in coerenza con gli standard nazionali e con gli obiettivi del Piano Nazionale di Ripresa e Resilienza (PNRR).
La Presidente Rea - "Non credo che il Governatore abbia messo mano al portafoglio perché noi infermieri glie lo abbiamo chiesto. Semplicemente sono le cose più urgenti e ragionevoli da fare, cosi come abbiamo scritto nella nostra lettera inviata appena eletto (in un altro servizio nelle prossime pagine, ndr). Più infermieri e più territorio. Ora è tempo per nuove assunzioni e di stabilizzare il precariato". Ha accolto cosi la presidente Opi Napoli Teresa Rea i provvedimenti assunti dalla giunta regionale. Più risorse per le assunzioni e per potenziare il territorio. Un passo decisivo per la sanità in Campania frutto anche della recente uscita dal piano di rientro. Più fondi per le case di comunità. Elemento importante per far crescere l'assistenza sanitaria di prossimità. Ma anche più controlli, a maggior ragione dopo la tragica vicenda del piccolo Domenico Caliendo.
Ma andiamo con ordine. Il piano del presidente Roberto Fico sembra chiaro: rafforzare il sistema sanitario, con investimenti importanti. Ma al tempo stesso controllarne meglio il buon andamento, con ispezioni mirate. Eccoli i primi passaggi della svolta che il governatore vuole imprimere alla sanità campana. Alcuni provvedimenti sono contenuti pari pari nella lettera delle priorità che l'Opi Napoli ha inviato a Pazzo Santa Lucia all'indomani dell'insediamento di Roberto Fico ai vertici del governo della Campania.

Gli Investimenti - Partiamo dall'elemento più importante: la prospettiva per le assunzioni. Dopo 19 anni si apre una nuova fase, in cui la Campania può tornare a investire seriamente nella sanità e quindi sul personale. Il tetto di spesa per assunzioni e adeguamenti contrattuali può finalmente salire. Il primo atto della giunta regionale dopo l'uscita dal piano di rientro è quello con il quale ha alzato di 62 milioni il tetto di spesa. Poi, riferisce una nota della Regione, il governatore annuncia di aver "dato mandato alla Direzione Generale per la Tutela della salute di procedere al riparto di 98 milioni di euro per il reclutamento del personale per il potenziamento dell'assistenza sanitaria territoriale". Portando il monte investimenti a superare di molto i 3 miliardi. L'importo complessivo del piano, inizialmente pari a 951.207.259,56 euro, è stato rideterminato in 1.131.731.195,49 euro. L'incremento - spiega una nota di Santa Lucia - è finalizzato alle assunzioni e agli adeguamenti contrattuali. Poi viene il territorio. Le case e gli ospedali di comunità, strutture finanziate con il Pnrr, previste in Campania sono 214. Si tratta di 169 case e 45 ospedali. Con le nuove 16 strutture varate dalla giunta il totale delle Case di Comunità finora attive è di 51.

Il Presidente Fico - «Un altro passo importante per costruire una sanità territoriale più vicina alle persone. Puntiamo a rafforzare il sistema sanitario regionale investendo su personale, infrastrutture e servizi territoriali, per una sanità più efficiente, capillare e vicina ai cittadini». «Ora le assunzioni – dice ancora il governatore - I provvedimenti approvati confermano l'impegno della Regione Campania. Interveniamo anche in altri ambiti, come quello delle dotazioni tecnologicamente avanzate, per migliorare la capacità di fornire servizi, l'efficienza energetica e promuovere la coesione territoriale. Continuiamo a lavorare con determinazione in questa direzione".

Gli Ispettori - Ma per rilanciare il livello della sanità in Campania non servono solo investimenti, anche controlli. Arrivano gli ispettori nelle strutture sanitarie campane. È stato adottato, infatti, il piano annuale del "servizio ispettivo sanitario e sociosanitario": sono previsti, quale attività ordinaria, accertamenti su 17 enti pubblici e 8 strutture private. Ma potranno esserci anche controlli straordinari su sollecitazioni del presidente della Regione. Gli occhi degli ispettori saranno puntati sulla correttezza amministrativa, sanitaria, farmaceutica e tecnica. Approvate, infine, le linee di indirizzo regionali per la prevenzione, la sorveglianza e il controllo della tubercolosi, quale strumento operativo e riferimento tecnico-organizzativo per uniformare l'assistenza su tutto il territorio regionale, nell'ottica della riorganizzazione della rete dei centri di riferimento, dell'appropriatezza diagnostico-terapeutica, dell'integrazione ospedale-territorio e della gestione del rischio.

Premiata l'ASL Napoli 2 e la Federico II

Il riparto delle maggiori risorse a disposizione segue il criterio di gratificare strutture che hanno sofferto di più per la carenza di organico

Il riparto delle maggiori risorse a disposizione segue il criterio di gratificare strutture che hanno sofferto di più per la carenza di organico.
(pdm) Nel rafforzare ospedali e Asl, il governatore, ha guardato soprattutto alle strutture che hanno sofferto di più della carenza di organico. E per questo l'Asl che di gran lunga riceve più fondi rispetto al 2025 è l'Asl Napoli 2 Nord: ben 11 milioni in più rispetto all'anno scorso, arrivando a 263 milioni. Per il resto le altre Asl ottengono quasi tutte 2 milioni in più: la Napoli 3 Sud arriva a 292 milioni, l'Asl di Salerno a 455 milioni, quella di Caserta a 306 milioni e quella di Avellino a 112 milioni. Nessun aumento per l'Asl di Benevento (che riceve quasi 63 milioni come lo scorso anno) e l'Asl Napoli 1 Centro, il cui tetto di spesa per il personale resta a 487 milioni, confermandosi come azienda sanitaria locale principale del sistema campano.

Gli Ospedali - Per quanto riguarda gli ospedali, l'aumento maggiore rispetto al 2025 va all'azienda ospedaliera universitaria Federico II che riceve 9,6 milioni in più per il personale: da circa 112 milioni a 122. Per il resto aumenti di 4 milioni per quasi tutte le altre strutture: il Cardarelli (da 203 a 207 milioni), il Santobono (da 96 a 100 milioni), l'azienda dei Colli (da 170 a 174 milioni) e l'azienda ospedaliera universitaria Vanvitelli (da 62 a 66 milioni). Stesso dicasi, 4 milioni in più, anche per gli altri grandi ospedali delle altre province: il Ruggi di Salerno (da 190 a 194 milioni), il Moscati di Avellino (da 110 a 114 milioni), il San Pio di Benevento (da 87 a 91 milioni) e il San Sebastiano di Caserta (da 101 a 105 milioni). "Solo" due milioni in più, invece, per il fabbisogno di personale dell'Istituto Pascale che passa da 70 a 72 milioni e mezzo all'anno.

Il Piano - Cosa significano questi fondi in più? Possibilità di assumere, sicuramente. Ma c'è anche il tema dei rinnovi contrattuali e delle stabilizzazioni.

Politica sanitaria

Fico: “Manterrò l’interim alla sanità ancora a lungo”

L'ex presidente della Camera conferma di tenere per se la delega per almeno altri 18 mesi. "Ringrazio il ministro per come è stato leale” e riconosce "il lavoro fatto dalla Giunta De Luca”. Allo studio un nuovo piano ospedaliero.

di Gaetano Artiola

“Per ora la delega la mantengo io, almeno per altri 18 mesi. Devo impostare un lavoro per come lo ho in mente. Conosco bene la strada che dobbiamo percorrere e poi, probabilmente, in 18 mesi potremo avere un assessore. Ma lo valuteremo". Dopo l'uscita della Campania dal piano di rientro per il debito sanitario, il presidente della Regione, Roberto Fico, conferma la scelta di non nominare un assessore alla Sanità. L'ex presidente della Camera rimarca il lavoro fatto "negli ultimi tre mesi, in modo dialogante e istituzionale". "Ringrazio il ministro per come è stato leale nei confronti della Regione", aggiunge Fico, riconoscendo "il lavoro enorme fatto dalla Giunta precedente rispetto al raggiungimento degli obiettivi dei Lea e dell'equilibrio finanziario, senza il quale non saremmo potuti uscire".Ora con il rientro dei poteri ordinari concretamente cosa cambia per gli utenti campani? Più risorse? Come si usano?

Gli obiettivi - Assunzioni, investimenti e ammodernamento delle strutture esistenti, sono questi i principali obiettivi e, a cascata, il miglioramento delle liste d’attesa per le prestazioni sanitarie. Uscire dal piano di rientro significa non essere più vincolati a una gestione emergenziale e poter programmare con maggiore libertà. Non è solo una questione di risorse aggiuntive, ma un reale cambio di prospettiva per poter affrontare la gestione e la programmazione della sanità con maggiori capacità di investimento, maggiore autonomia organizzativa e possibilità di rafforzare la rete territoriale. Un lavoro che si deve tradurre in servizi più accessibili e tempi più rapidi per i cittadini campani.
“Ora dobbiamo scrivere un nuovo piano ospedaliero della Regione – osserva Fico - lavorare sulla sanità territoriale, sulle case di comunità, gli ospedali di comunità, sulla telemedicina, lavorare sulla rete di emergenza urgenza e potenziare gli organici negli ospedali, accelerare sulle assunzioni, stabilizzare chi da anni lavora in condizioni precarie e rendere il sistema sanitario campano più attrattivo, perché senza un numero sufficiente di medici e infermieri non si possono garantire servizi adeguati. Allo stesso tempo è necessario aumentare l’offerta nel pubblico, utilizzare in modo appropriato il privato accreditato e rafforzare i sistemi di monitoraggio, così da assicurare trasparenza e tempi certi ai cittadini. Questo lavoro si inserisce in una visione più ampia: aggiornare il piano ospedaliero regionale e rafforzare la rete dell’emergenza-urgenza, a partire dai pronto soccorso. L’obiettivo deve essere ridurre i tempi di attesa e garantire risposte rapide ed efficaci, costruendo una sanità più vicina alle persone».

Il Ministero dà l’ok, dopo 19 anni Campania fuori dai vincoli di spesa

Dalla documentazione presentata al tavolo di verifica del Mef, è emerso che la Regione Campania ha raggiunto la sufficienza nelle tre aree di assistenza monitorate dal Nuovo Sistema di Garanzia per l’anno 2024 confermando il risultato dell’anno precedente. Si riscontrano inoltre significativi miglioramenti relativi agli screening e ai letti di RSA. Con queste motivazioni il Ministero della Salute ha accolto la richiesta di uscita dal piano di rientro della Regione Campania. Nel corso del tavolo di verifica con il Mef, sono stati esaminati i risultati raggiunti in merito alle richieste formulate dal Ministero nel corso delle verifiche intermedie che si sono svolte nel 2025. Era stato richiesto di poter verificare l’effettivo miglioramento dei programmi di screening e di potenziamento dei letti di RSA, e di poter dimostrare il consolidamento dei dati di corretta erogazione dei Lea. La soddisfazione del presidente Fico per il risultato ottenuto è tutta un programma: “Esprimo piena soddisfazione per l’uscita dal Piano di rientro della Regione Campania, È una notizia importante per i cittadini, per gli operatori della sanità, il personale medico e infermieristico, per tutto il settore sanitario. La decisione adottata dal Ministero della Salute permette, infatti, all’Amministrazione di tornare a una regolare e ordinaria gestione della Sanità. Questo significa poter programmare investimenti, assumere personale, ammodernare strutture e tecnologie, rafforzare nel suo complesso il sistema sanitario”. Dopo 19 anni la Campania è fuori dal piano di rientro del debito. L'annuncio del ministero della Salute è stato salutato con soddisfazione anche perché si chiude una lunga parentesi, iniziato da quando nel 2007 era presidente della giunta regionale della Campania, Antonio Bassolino che e che è stato per circa due decenni oggetto di scontro politico. “Da oltre dieci anni il bilancio della sanità campana era in attivo insieme con solo altre tre regioni d'Italia. Erano stati raggiunti tutti gli obiettivi previsti dalle leggi dello stato in relazione alle tre aree mediche sottoposte a valutazione (quella ospedaliera, quella territoriale e quella della prevenzione)", ha osservato invece, in un post sui social, l’ex presidente della Regione Campania, Vincenzo De Luca sottolineando che per circa dieci anni la dotazione organica di medici ed infermieri fosse molto al di sotto delle reali esigenze.

Politica sanitaria

LETTERA APERTA AL PRESIDENTE ROBERTO FICO

L'Opi Napoli al Governatore: "Più assunzioni, più territorio"

I punti salienti: un serio e consistente piano di assunzioni e di stabilizzazione dei precari; liste d'attesa e screening oncologici; investire nella prossimità assistenziale; valorizzazione e crescita professionale degli infermieri.

di Nina De Martino

In una missiva inviata al presidente Fico, all'indomani del suo insediamento, l'Opi Napoli ha illustrato quelle che giudica le priorità da affrontare per rimuovere gli antichi nodi di una sanità Campana ancora lontana dai livelli di eccellenza cui deve mirare.
Con più di 2mila posti letto in meno su un fabbisogno di 10.413 a fronte di 3 milioni di abitanti, 18 mila addetti mancanti, dei 400 milioni spesi ogni anno per la migrazione il 70% proviene dall'area metropolitana, 700 precari da stabilizzare. Infine sulle 143 strutture di prossimità previste, di cui 88 Case di Comunità, 32 Centrali Operative e 23 Ospedali di Comunità solo 50 sono completate, 1 hospice sui 10 previsti. Sono questi i numeri del disagio nella sanità nell'area metropolitana di Napoli segnalati al governatore. Noi infermieri crediamo in una sanità come bene comune. Nella quale il cittadino è al centro dell' intero processo di cura e di assistenza. Concordiamo con la sua prima uscita nella quale ha dichiara apertamente di voler "tenere la politica fuori dagli ospedali" e poi di "dare avvio ad un nuovo piano ospedaliero". Nondimeno però, egregio Presidente desideriamo sottoporle alcuni punti per noi dirimenti che riteniamo siano essenziali per risolvere alcune gravi criticità che tutt'ora affliggono la sanità campana.
1) - Riteniamo sia maturo il momento per esercitare una forte azione sul Governo nazionale per una rapida uscita dal piano di rientro. Attività che sappiamo Lei ha già avviato. E che condividiamo in quanto premessa essenziale per porre rimedio alla grave carenza di personale nel Servizio sanitario regionale, che incide negativamente sulla qualità dei servizi erogati, sull'abbattimento delle liste di attesa e sul rispetto dei tempi di erogazione delle prestazioni sanitarie, oltre che sulle condizioni di lavoro del personale in servizio.
2) - Accorciare liste d'attesa e screening oncologici si può dando contemporaneamente impulso ai processi di prevenzione portando la cultura di corretti stili di vita e della cura della salute anche nelle scuole. Processi educativi indispensabili per il contenimento nel prossimo futuro di patologie complesse, costose per le casse pubbliche e per le tasche dei cittadini.
3) - Investire in sanità pubblica per difendere i fragili di salute e le fragilità sociali: in Italia quasi sei milioni di cittadini (fonte Gimbe) rinuncia alle cure per difficoltà nel pagare le prestazioni sanitarie. Di questi (fonte Ministero Salute) il 20 per cento è in Campania.
4) - In Campania manca quasi del tutto una Rete territoriale di assistenza; vale a dire ospedali e Case di comunità, infermiere di famiglia. Una sanità di prossimità più vicina ai bisogni dei cittadini come in altre regioni già esiste. Una sanità più vicina alla gente alle persone fragili e agli anziani; anche per evitare accessi impropri ai P.S. di ospedali sempre più affollati e congestionati anche da codici bianchi e verdi risolvibili sul territorio. Per fare questo bisogna assumere personale, infermieri innanzitutto, ma anche medici, oss. In Campania mancano almeno 18 mila sanitari. Questo grande piano di assunzioni potrebbe anche dare posti di lavoro e trattenere giovani che oggi emigrano alla ricerca di posti di lavoro.
5) Infine Presidente, riteniamo non più rinviabile quella valorizzazione e crescita professionale degli infermieri che altrove è già realtà. Parliamo del riconoscimento del loro percorso formativo universitario, delle loro qualità professionali e dell'autonomia necessaria a garantire servizi e assistenza all'altezza di un Servizio sanitario universalistico ed equo. Riteniamo che il ricorso al precariato e alle soluzioni emergenziali per quanto riguarda la carenza di organici sia da ritenersi definitivamente finito. Chiediamo da Lei una nuova governance della sanità e nuovo impulso al sistema sanitario, perché cresca intorno alle persone; che tenga conto del merito e di quanto la professione infermieristica sia decisiva nel sistema salute regionale. Gli infermieri sono professionisti da anni in attesa di una nuova organizzazione del lavoro che riconosca l'alto livello di professionalità ormai raggiunto, cancellando le attuali difformità che non consentono spesso di far gestire nel modo più corretto e meritocratico il personale nelle aziende pubbliche e private accreditate.

La Campania spende più di tutti in medicinali

Una spesa che supera i 3,8 miliardi di euro, con un consumo di oltre 4 miliardi di medicinali. Rispetto alla media nazionale, la Campania fa registrare una spesa maggiore del 19,2% e consumi maggiori per l'11,3%. Sono i dati sull'uso dei farmaci in Campania relativi al 2024 che emergono dal rapporto nazionale fornito dall'Aifa. L'agenzia italiana del farmaco ha infatti redatto il rapporto regionale, spiegando come lo stesso "fornisce una sintesi dei dati relativi ai consumi e alla spesa dei medicinali nell'anno 2024, mediante l'elaborazione di diversi flussi informativi previsti dalla normativa vigente, che consentono di ricomporre l'assistenza farmaceutica in ambito territoriale e ospedaliero, sia a carico del servizio sanitario nazionale, erogati in regime di assistenza convenzionata, distribuzione diretta, per conto e somministrazione ospedaliera, sia tramite l'acquisto privato da parte del cittadino". Stando a questi numeri, in Campania nell'anno preso come riferimento, la spesa farmaceutica è stata complessivamente di 3.873.409.343 euro, il 76% gravante sulla parte pubblica, mentre le dosi di farmaci consumate sono state 4.029.598.746, il 69,7% erogate dal servizio sanitario nazionale e la restante parte (30,3%) derivante da acquisti privati (le confezioni erogate per singolo cittadino) 42,7). "L'analisi dei consumi dei farmaci acquistati dalle strutture sanitarie pubbliche - spiegano ancora dall'Aifa - è stata condotta utilizzando i dati provenienti dal flusso della tracciabilità del farmaco, relativi alla fornitura di medicinali da parte delle aziende farmaceutiche alle strutture sanitarie pubbliche (sell?in) che, successivamente, vengono utilizzati all'interno delle strutture stesse o dispensati direttamente al paziente per un loro utilizzo anche al di fuori delle strutture sanitarie", mentre "per l'analisi dei consumi in regime di assistenza convenzionata è stato utilizzato il flusso informativo delle prestazioni farmaceutiche erogate dalle farmacie pubbliche e private".

Politica sanitaria

AUTONOMIA DIFFERENZIATA

Via libera ai preliminari, Mezzogiorno a rischio

Le Regioni Liguria, Lombardia, Piemonte e Veneto puntano ad ottenere cinque leve di flessibilità aggiuntiva: tariffe proprie, investimenti autonomi, fondi integrativi e assunzioni concorrenziali. Salvaguardie sui Livelli essenziali di assistenza, ma il rischio di una sanità a due velocità è concreto. No di Campania, Emilia-Romagna, Toscana, Umbria, Sardegna e Puglia.

di **Peppe Papa**

La Conferenza Unificata ha espresso parere favorevole sugli schemi di intesa preliminare tra il Governo e le Regioni Liguria, Lombardia, Piemonte e Veneto in materia di "tutela della salute – coordinamento della finanza pubblica". Le quattro intese – identiche nella struttura, sette articoli ciascuna – attribuiscono alle Regioni richiedenti un pacchetto di funzioni di maggiore autonomia nella gestione del proprio servizio sanitario regionale. Il cuore del provvedimento è l'articolo 3, che elenca le cinque leve operative riconosciute a ciascuna Regione, subordinatamente al rispetto dei Livelli essenziali di assistenza (Lea) e dell'equilibrio economico-finanziario del proprio sistema sanitario. Il via libera, per il quale era sufficiente la maggioranza semplice, ha visto il voto contrario e compatto delle sei Regioni: Emilia-Romagna, Toscana, Umbria, Sardegna, Puglia e Campania.

Tariffe diverse - La prima funzione riguarda la definizione di tariffe di rimborso e remunerazione diverse da quelle nazionali. Lombardia, Veneto, Piemonte e Liguria potranno pagare di più – o diversamente – ospedali e cliniche convenzionate rispetto agli standard nazionali, purché coprano con risorse proprie la differenza. Si tratta di una flessibilità già in parte praticata informalmente, ma che acquisterebbe ora una base giuridica esplicita.

Gestione autonoma - La seconda funzione è la gestione autonoma degli investimenti in edilizia e tecnologia sanitaria. Le Regioni potranno gestire in piena autonomia le risorse trasferite dallo Stato per gli investimenti sul patrimonio edilizio e tecnologico delle proprie aziende sanitarie, attraverso la stipula di accordi di programma quadriennali. La ratio dichiarata è la riduzione dei tempi di realizzazione delle opere e una maggiore flessibilità nell'utilizzo delle risorse.

Fondi integrativi - La terza funzione riguarda l'istituzione e gestione di fondi sanitari integrativi. Le Regioni potranno istituire e gestire fondi sanitari interamente integrativi del Servizio sanitario nazionale, riferibili a prestazioni che vanno al di là dei Lea vigenti. È forse la funzione più delicata dal punto di vista dell'equità: la possibilità di offrire ai propri cittadini prestazioni aggiuntive rispetto ai Lea – garantite da fondi regionali – rischia di creare una sanità a due velocità non solo tra Nord e Sud, ma anche all'interno delle singole Regioni, tra chi potrà accedere alle prestazioni integrative e chi no.

Assunzioni di personale - La quarta funzione concerne la destinazione di risorse aggiuntive per l'assunzione di personale sanitario. Le Regioni potranno destinare alle proprie aziende sanitarie risorse finanziarie aggiuntive per l'assunzione di personale con contratti a tempo determinato o per l'incremento delle prestazioni aggiuntive dei dirigenti medici e del personale del comparto sanitario. In un contesto di grave carenza di medici e infermieri, questa funzione potrebbe consentire alle Regioni più ricche di attrarre personale sanitario con condizioni economiche più competitive rispetto alle altre Regioni, alimentando una migrazione interna dei professionisti della salute già in atto.

Riallocazione risorse - La quinta funzione è la riallocazione di risorse nazionali vincolate in caso di economie. Le Regioni potranno riallocare su altri ambiti della spesa sanitaria le risorse nazionali che risultassero eccedenti rispetto agli obiettivi per cui erano state assegnate, previa attestazione del raggiungimento degli obiettivi.

I vincoli e le salvaguardie - Gli schemi di intesa sono costruiti attorno a un sistema di condizionalità piuttosto articolato. L'articolo 2 chiarisce che la maggiore autonomia non può incidere sul finanziamento del Servizio sanitario nazionale né sui criteri di riparto degli investimenti, e deve garantire la neutralità degli effetti per lo Stato e per le altre Regioni – compresa la mobilità sanitaria. L'articolo 7 condiziona l'efficacia delle intese alla permanenza dell'equilibrio economico-finanziario e alla corretta erogazione dei Lea: se una Regione dovesse perdere uno di questi due requisiti, l'intesa cesserebbe di avere efficacia, con una procedura che richiede una legge approvata a maggioranza assoluta delle Camere. È prevista inoltre l'istituzione di una Commissione paritetica Stato-Regione-autonomie locali, con funzioni di monitoraggio annuale sull'attuazione dell'intesa. La clausola di invarianza finanziaria stabilisce che dall'applicazione dell'intesa non derivano nuovi o maggiori oneri a carico della finanza pubblica. La durata delle intese, infine, è fissata in dieci anni, con rinnovo automatico per un uguale periodo salvo diversa volontà di una delle parti manifestata almeno dodici mesi prima della scadenza.

FONDO SANITARIO NAZIONALE

Crescono le risorse al Sud, previste 7mila assunzioni

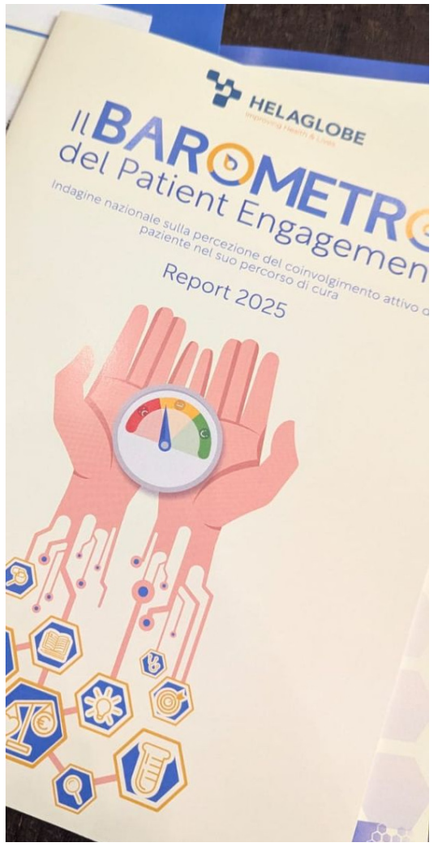
Approvato il riparto del Fondo 2025. Per le Case di comunità 7mila assunzioni nel 2026. Gemmato: "Il '25 conferma il significativo aumento delle risorse per il Ssn, con un finanziamento di oltre 136,5 miliardi di euro. E con la manovra '26 arriveremo a 143 miliardi di euro", Alle regioni del Sud andranno 680 milioni di euro del Fsn nel triennio 2023-2025, con un aumento pari a 229 milioni.

(p.p.) Più risorse economiche per la sanità del Mezzogiorno, aumenti e indennità specifiche per medici ed infermieri ma anche fondi per stabilizzare la cosiddetta 'Farmacia dei servizi', ovvero la nuova farmacia non più solo dispensatrice di farmaci ma anche di servizi aggiuntivi come screening e vaccinazioni. Il Fondo sanitario nazionale (Fsn) 2025 è stato ripartito tra le Regioni e Province autonome e servirà a garantire ai cittadini queste, ed altre, misure concrete. Il Comitato interministeriale per la programmazione economica e lo sviluppo sostenibile (Cipess) ha infatti approvato il riparto delle risorse destinate al Servizio sanitario nazionale per l'anno '25 per un totale pari a 136,5 miliardi di euro, mentre si guarda al prossimo avvio delle Case di comunità per le quali sono in arrivo 7mila assunzioni tra medici e infermieri. Ad illustrare le misure, al termine della riunione del Cipess a Palazzo Chigi, il sottosegretario alla Salute Marcello Gemmato e il sottosegretario con delega al Cipess Alessandro Morelli. Il '25 "conferma il significativo aumento delle risorse per il Ssn, con un finanziamento di oltre 136,5 miliardi di euro. E con la manovra '26 arriveremo a 143 miliardi di euro", ha affermato Gemmato, sottolineando come si apra "una stagione d'investimenti per la sanità pubblica".

Sud - Faro puntato sul Mezzogiorno: alle regioni del Sud andranno 680 milioni di euro del Fsn nel triennio 2023-2025, con un aumento pari a 229 milioni. Per il terzo anno consecutivo vengono applicati i nuovi criteri di riparto del Fondo che prevedono una redistribuzione delle risorse sulla base del tasso di mortalità sotto i 75 anni e del cosiddetto coefficiente di deprivazione, che considera l'incidenza della povertà relativa individuale, i livelli di bassa scolarizzazione e il tasso di disoccupazione. Nel '25 questi parametri determinano appunto un aumento complessivo di risorse verso il Sud di circa 229 milioni. Nel Fsn, ha ricordato Morelli, ci sono "2,5 miliardi di euro in più rispetto all'anno precedente". E va sottolineata, ha spiegato, "un'importante novità con la quale le regioni hanno introdotto un nuovo criterio di riparto per la quota premiale che tiene conto dell'indice di densità abitativa e di estensione territoriale, e attribuisce maggiori risorse ai territori che meritano attenzione come Abruzzo, Basilicata, Molise e Calabria". Si cerca, cioè, di convogliare maggiori risorse verso le aree con più criticità. Previsto, inoltre, l'aumento del limite di spesa per le prestazioni accreditate private e la possibilità di inserire alcune patologie, come Parkinson e demenza, nel percorso nazionale di assistenza.

Personale sanitario - Una parte rilevante delle risorse è destinata poi alla valorizzazione del personale sanitario: 500 milioni di euro per l'incremento dell'indennità di esclusività della dirigenza medica, veterinaria e sanitaria; 370 per l'aumento dell'indennità di specificità infermieristica; 340 per l'indennità di pronto soccorso; 50 per finanziare l'indennità di specificità medico-veterinaria e oltre 423 milioni per l'aumento delle tariffe orarie delle prestazioni aggiuntive per il recupero delle liste d'attesa. Intanto si guarda anche alle future Case di comunità, perno della riforma dell'assistenza territoriale per rendere i servizi più prossimi ai cittadini. Il termine ultimo per il loro avvio è fissato a giugno '26 e il Sud è ancora indietro, ma le regioni hanno ancora margine e quest'anno, ha ricordato Gemmato, è prevista l'assunzione di 6mila infermieri e mille medici per renderle operative.

Politica sanitaria



MAGLIA NERA ALLA CAMPANIA

Il gap digitale frena screening e prevenzione

I dati del Barometro del Patient Engagement 2025. L'accesso ai servizi sanitari attraverso le piattaforme tecnologiche in Campania è il peggiore d'Italia

di Gaetano Artiola

Il divario tra le Regioni trova radici anche sul terreno dell'innovazione e della digitalizzazione frenando screening e politiche per la prevenzione. Fondamentali, queste ultime, per sbarrare il passo alle malattie croniche, oncologiche e degenerative negli anziani, ma anche pilastri della sostenibilità e della riduzione dei costi del Servizio sanitario nazionale. I dati del Barometro del Patient Engagement 2025, l'indagine nazionale di Helaglobe condotta su oltre 4.200 persone in tutte le regioni, fotografa per la prima volta le differenze regionali su tre dimensioni chiave dell'esperienza sanitaria dei cittadini: accessibilità digitale, gestione delle cure e coinvolgimento del paziente.

Accessibilità Digitale - Il Barometro introduce quest'anno l'indice di accessibilità digitale per la Salute (IADS), che misura la capacità dei cittadini di orientarsi e interagire con i servizi sanitari attraverso strumenti digitali e quella delle strutture sanitarie di contattare e coinvolgere i cittadini tramite servizi online. Il punteggio medio nazionale è basso e si ferma a 46 su 100 ma con forti disuguaglianze interne: l'Abruzzo guida la classifica con un punteggio medio percentuale di 52,20, mentre la Campania chiude con 39,92. Marche, Trentino-Alto Adige e Abruzzo sono le aree dello Stivale in cui i cittadini padroneggiano meglio i servizi web, mentre Friuli-Venezia Giulia, Molise e Campania registrano i tassi più bassi. Il risvolto più preoccupante riguarda la prevenzione e la percentuale di adesione agli screening che scende mediamente al 71% tra chi ha scarso accesso digitale, contro l'89% di chi usa con facilità portali e servizi online. Un dato non trascurabile: alla Campania la bassa adesione agli screening oncologici (molto sotto la soglia minima) è costata la bocciatura del Ministero della Salute nella richiesta di fuoriuscita dal Piano di rientro, nonostante i conti di Asl e ospedali siano in pareggio dal 2013 e pur nella sufficienza sui nuovi Lea. Non è un caso che l'89% dei cittadini che utilizzano con facilità portali e servizi online si sente coinvolto nelle iniziative di promozione della salute proposte da istituzioni e professionisti sanitari in un contesto in cui comunicazione interpersonale e umanizzazione delle cure restano un dato critico visto che il 25% dei pazienti prova frustrazione o rabbia al termine della visita non sentendosi completamente soddisfatto dalla informazioni ricevute.

La Componente Emotiva - Il confronto tra regioni è posto su tre livelli di engagement (clinico, decisionale, organizzativo) e rivela un dato significativo: la componente clinica, vale a dire la qualità percepita della relazione quotidiana di cura, è abbastanza elevata ovunque (range 60-74 punti) e uniforme. Il coinvolgimento decisionale invece, ossia la partecipazione alle scelte terapeutiche e ai piani di cura (50-63 punti), mostra maggiore variabilità, mentre il livello organizzativo, relativo alla valutazione e al miglioramento dei servizi ad essere mediamente più basso ovunque (13-25 punti), ma anche spia di un deficit strutturale nel modo in cui i sistemi sanitari integrano il paziente nei processi organizzativi. Dati che pesano di più nelle regioni con il più basso punteggio medio (Calabria, Campania e Molise), non a caso quelle con una minore aspettativa di vita alla nascita e che scontano la maggiore migrazione sanitaria. Sul versante della qualità percepita i dati evidenziano un nesso diretto tra coinvolgimento clinico ed emozioni vissute dal paziente. Tra chi non si sente coinvolto nelle decisioni sanitarie la serenità riguarda appena il 12% dei casi e l'aumento di coinvolgimento clinico riduce significativamente l'esperienza emotiva negativa. «Il farmaco più usato in medicina è il medico stesso», afferma Gaetano Piccinocchi, componente del board scientifico del Barometro. «Senza una reale partecipazione del paziente, anche il migliore dei medici di famiglia non può che fare un intervento parziale».

«Per migliorare la salute degli italiani non dobbiamo cambiare le strategie di prevenzione, che sono già consolidate, ma la cultura dei cittadini - conclude Annamaria Colao, titolare della Cattedra Unesco della Federico II di Napoli e vicepresidente del Consiglio Superiore della Sanità oltre che componente del board scientifico - il coinvolgimento attivo deve iniziare dai banchi di scuola: la mia battaglia è portare lo studio della biologia umana nei programmi scolastici, per insegnare ai ragazzi le scelte giuste che si porteranno dietro nell'età adulta».

IL MINISTRO SCHILLACI A NAPOLI

«Inaccettabile che le cure dipendano dal Cap di residenza»

La digitalizzazione contro le disparità territoriali

Si è perlato di fondi, di rapporti con la Regione, delle liste d'attesa. Ma il cuore dell'intervento di Schillaci a Napoli è stato però la lotta alle disuguaglianze geografiche nel diritto alla salute. Il Ministro ha usato parole forti per definire il divario tra Nord e Sud: "Oggi è inaccettabile che l'accessibilità alle cure dipenda dal Cap in cui si risiede. La digitalizzazione è lo strumento che ci può permettere di superare queste differenze, rendendo la sanità più equa e vicina ai cittadini, tanto nelle aree urbane quanto nei piccoli centri". Secondo il titolare della Salute, l'innovazione tecnologica e l'Intelligenza Artificiale rappresentano un'opportunità imperdibile per modernizzare la sanità pubblica, purché quest'ultima rimanga "sempre governata dall'intelligenza umana". L'obiettivo dichiarato dal Governo è quello di una sanità più sensibile ai cambiamenti sociali e demografici, capace di sfruttare i dati per migliorare l'efficacia dei trattamenti.

Liste d'attesa - Sulla questione calda che rappresenta il tallone d'Achille del sistema sanitario regionale, il ministro sembra ottimista. "L'interlocuzione è ottima anche su questo aspetto delle liste d'attesa. Mi aspetto il cambio di passo e sono certo che ci sarà perché le liste d'attesa rappresentano veramente per i cittadini la parte meno bella del nostro Servizio sanitario nazionale che io difendo perché è veramente pieno di tante eccellenze".

L'incubo dei cyber-attacchi - Infine, un monito severo è stato lanciato sul tema della sicurezza informatica. In un sistema sempre più interconnesso, la protezione dei dati non è solo una questione di privacy, ma di operatività vitale. "Ho l'incubo che qualcuno faccia irruzione digitale negli ospedali - ha confessato Schillaci - perché un attacco informatico vorrebbe dire bloccare le sale operatorie e la diagnostica per immagini". Il Ministro ha sottolineato come i dati sanitari abbiano oggi un valore economico immenso sul mercato nero, rendendo fondamentale l'investimento in cybersecurity: "Dobbiamo gestire i dati in maniera adeguata per la sicurezza dei cittadini. Sono indispensabili per migliorare le cure, ma la loro protezione è fondamentale per evitare che il sistema si paralizzi".

NUOVE LAUREE PER GLI INFERMIERI

La ministra Bernini ha firmato i decreti

I corsi magistrali introdotti per rispondere alla carenza di personale. Gli obiettivi formativi. Le competenze aggiuntive.

di Peppe Papa

Sono finalmente in arrivo le nuove lauree per gli infermieri. Con la firma della ministra dell'Università e della Ricerca, Anna Maria Bernini, si procede ora più spediti lungo la strada che porterà al riordino della formazione universitaria in Infermieristica. Decreti che rivedono l'articolazione dei corsi di laurea, rafforzano la formazione di base e introducono specifici percorsi di laurea magistrale dedicati alla specializzazione.

Le nuove lauree – Una riforma che ha come principale obiettivo di quello di rispondere alla carenza di personale infermieristico, in particolare di profili generalisti, e di adeguare la formazione all'evoluzione del servizio sanitario nazionale. Tra le novità dei provvedimenti, spiegano dal Miur, l'introduzione di due nuovi percorsi formativi magistrali in ambiti strategici per il SSN: Infermieristica nelle cure primarie e di famiglia e comunità e Infermieristica nelle cure intensive e nell'emergenza. In parallelo, viene confermato come percorso distinto l'indirizzo magistrale a carattere manageriale delle Scienze ostetriche, dedicato alla formazione di profili con funzioni organizzative e gestionali. Gli Obiettivi formativi - Nell'ambito dei provvedimenti, inoltre, sono rivisti gli obiettivi formativi e i criteri di accesso per la professione sanitaria di infermiere pediatrico che avverrà attraverso una laurea magistrale specialistica (Infermieristica nelle cure neonatali e pediatriche) successiva all'abilitazione come infermiere, consentendo quindi di esercitare anche la professione di infermiere di base. È previsto un periodo transitorio per gli studenti già iscritti durante il quale le università garantiranno il completamento dei percorsi formativi in Infermieristica pediatrica fino all'anno accademico 2027/2028, con pieno riconoscimento e spendibilità dei titoli conseguiti.

Le competenze aggiuntive - Tra le competenze acquisite, la capacità di prescrivere trattamenti assistenziali quali presidi sanitari, ausili, tecnologie specifiche o altro, necessari a garantire continuità e sicurezza delle cure nell'infermieristica di famiglia e comunità; progettare e intervenire operativamente in ordine a problemi assistenziali complessi come malattie croniche e/o disabilitanti e progettare e attuare interventi di promozione della salute e prevenzione delle malattie rivolti a neonati, bambini e adolescenti e alle loro famiglie, nei diversi contesti sanitari e comunitari.

I passaggi precedenti - La revisione è il risultato dei lavori del tavolo tecnico sull'Infermieristica, istituito nel 2023, che ha coinvolto il ministero dell'Università e della Ricerca, il ministero della Salute, la federazione nazionale ordini delle professioni infermieristiche, il consiglio universitario nazionale (Cun), l'agenzia di valutazione del sistema universitario e della ricerca (Anvur) e la conferenza permanente delle lauree delle professioni sanitarie. Sul provvedimento è stato acquisito il parere favorevole della conferenza dei rettori delle università italiane-Crui.

AGGRESSIONI A OPERATORI SANITARI

Più di 18mila episodi, 2025 l'annus horribilis

Sono i dati che emergono dalla Relazione annuale dell'Osservatorio nazionale sulla sicurezza degli esercenti le professioni sanitarie e sociosanitarie pubblicata sul sito del ministero della Salute.

Nel 2025 sono state quasi 18mila le aggressioni a operatori sanitari e sociosanitari con oltre 23mila operatori (23.367), considerato che un singolo episodio può interessare più persone. Sono i dati che emergono dalla Relazione annuale dell'Osservatorio nazionale sulla sicurezza degli esercenti le professioni sanitarie e socio-sanitarie pubblicata sul sito del ministero della Salute, in occasione della Giornata nazionale di educazione e prevenzione contro la violenza nei confronti degli operatori sanitari e socio-sanitari che si celebra il 12 marzo. Il 2025 si ricorderà come l'annus horribilis delle aggressioni al personale sanitario, con un aumento del 15% rispetto all'anno precedente. Nella maggior parte dei casi si tratta di violenze verbali, ma continuano a verificarsi anche aggressioni fisiche. Gli infermieri risultano tra i professionisti più colpiti, spesso esposti a situazioni di forte tensione assistenziale. Il 78% delle aggressioni avviene in ospedale, in particolare nei contesti ad alta intensità assistenziale come pronto soccorso, servizi psichiatrici e continuità assistenziale. "Non ci si può rassegnare, La violenza contro chi cura è da ritenersi inaccettabile sotto ogni aspetto. È necessario rafforzare la sicurezza nelle strutture sanitarie, investire nella prevenzione, nella formazione sulla gestione dei conflitti e promuovere una cultura del rispetto verso tutti i professionisti della salute. Proteggere gli operatori sanitari significa proteggere la sanità e i cittadini" ha commentato in un comunicato alla stampa la presidente Opi Napoli Teresa Rea.

I “camici bianchi” uniscono le forze

Fronte comune tra l'Ordine delle professioni infermieristiche di Napoli e l'Ordine interprovinciale delle 18 professioni sanitarie (TSRM PSTRP). I presidenti Teresa Rea e Franco Ascolese siglano l'accordo: “Intendiamo rappresentare in maniera congiunta, ai tavoli istituzionali di Ministero, Regione e Consiglio regionale, le necessità e le urgenze dei professionisti che rappresentiamo nell’esclusivo interesse dei pazienti”.

di **Gaetano Artiola**

“*Scegli i tuoi alleati e impara a lottare in compagnia, perché nessuno vince una guerra da solo*” (cit. Paulo Coelho).
Devono aver pensato qualcosa di simile i presidenti Rea e Ascolese prima di mettere in piedi quest’alleanza. Ma non ci sono guerre da dichiarare, né nemici da sconfiggere. Solo una visione comune della salute e professionisti da valorizzare. L'obiettivo è quello di avere più voce in capitolo ai tavoli istituzionali, lì dove si decide la politica sanitaria. Non per fare la voce grossa. Ma per mettere a centro dell'intero processo di cura e assistenza sanitaria il paziente, spesso trascurato da chi decide. Sta di fatto che buona parte delle professioni che operano nel campo della salute hanno deciso di unire le forze: per la prima volta dalla sua costituzione, avvenuta nel 2018, l’Ordine interprovinciale delle 18 professioni sanitarie di Napoli, Avellino, Benevento e Caserta dei tecnici sanitari di radiologia medica e delle professioni sanitarie tecniche della riabilitazione e prevenzione (Tsrm Pstrp) ha ospitato presso la propria sede al Centro Direzionale un Consiglio direttivo congiunto con l’Ordine degli infermieri di Napoli.
A guidare la seduta comune i rispettivi presidenti dei due Ordini, Franco Ascolese per le 18 professioni e Teresa Rea per gli infermieri partenopei. “Rappresentiamo una platea di quasi 35 mila camici bianchi che ogni giorno lavorano negli ospedali e negli ambulatori della Sanità pubblica, privata e accreditata della Campania – sottolineano Ascolese e Rea in una nota comune – e intendiamo rappresentare in maniera congiunta, ai tavoli istituzionali di Ministero, Regione e Consiglio regionale, le necessità e urgenze dei professionisti che rappresentiamo nell’esclusivo interesse dei pazienti”.
Una proposta dunque per configurare un fronte comune pronto a collaborare nel governo della Salute in Campania.
Fari puntati sui fabbisogni occupazionali di Asl e ospedali, sulle carenze di personale del comparto e delle varie articolazioni della Sanità pubblica campana ma anche sui nodi irrisolti della dirigenza delle professioni sanitarie, della formazione e dello sviluppo della libera professione come anche la valorizzazione degli asset delle cure di prossimità che incrociano le necessità delle fasce di cittadini più vulnerabili formate da pazienti cronici e anziani. Un luogo comune e integrato anche per proporre la valorizzazione dei vari profili professionali impiegati nelle cure alla luce delle nuove opportunità offerte dalla digitalizzazione e dall’approccio multiprofessionale e di prossimità anche a domicilio del paziente per fronteggiare le malattie croniche e garantire la sostenibilità.

DIRIGENTI DELLE PROFESSIONI SANITARIE

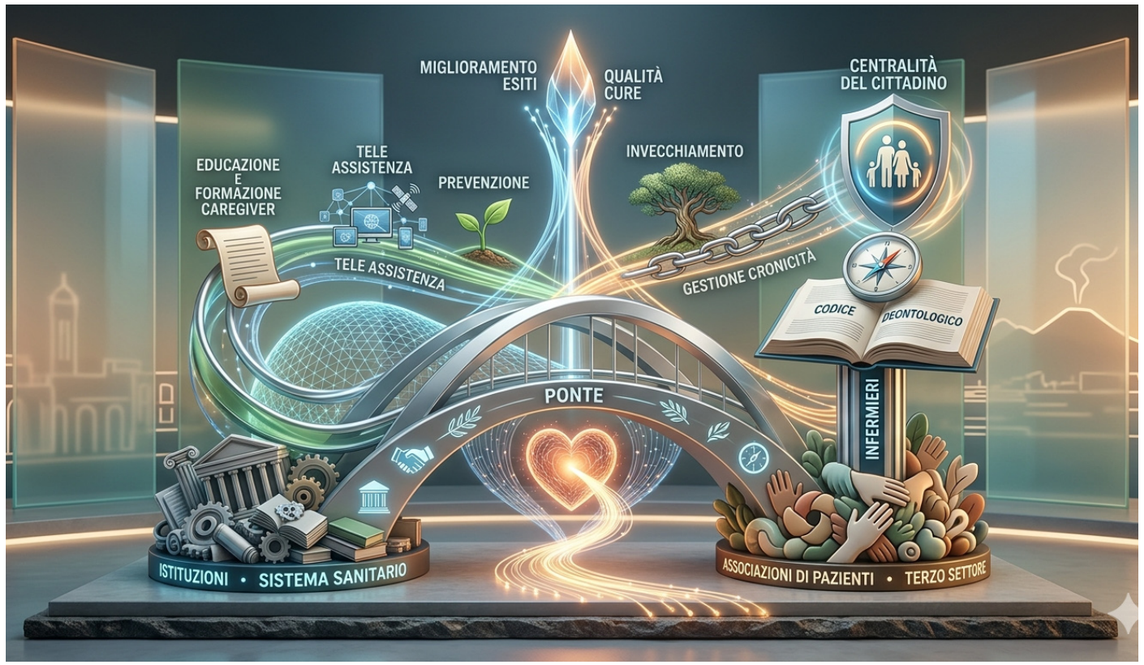
Inattuata la norma regionale dell’agosto 2025

Nota congiunta alla Regione di Tecnici, Fisioterapisti, infermieri e Ostetriche. Qual è lo stato di attuazione delle procedure di reclutamento dei dirigenti delle Professioni sanitarie? Quali iniziative si intendono adottare per concludere in tempi brevi le procedure di copertura dei posti vacanti nelle piante organiche di Asl e ospedali? E ancora: a che punto è lo scorrimento delle graduatorie vigenti e c’è un indirizzo regionale condiviso per l'espletamento di nuove procedure concorsuali? Sono queste le richieste formulate in una nota indirizzata al Governatore della Regione Campania Roberto Fico e agli Uffici del dipartimento Salute e del Personale, dall’ intera platea delle Professioni sanitarie riunita in un fronte comune in cui convergono l’Ordine interprovinciale di Napoli, Avellino, Benevento e Caserta delle 18 professioni sanitarie dei Tecnici di radiologia e Professioni sanitarie tecniche, della riabilitazione e prevenzione (in rappresentanza di circa 12 mila iscritti), l’Ordine interprovinciale dei Fisioterapisti (che riunisce altri 5 mila iscritti circa) e poi oltre 22 mila infermieri afferenti all’Ordine di Napoli a cui si aggiungono le Ostetriche dell’Ordine della provincia di Napoli. Fari puntati dunque sul nodo irrisolto della carenza di Dirigenti delle Professioni sanitarie, sul mancato reclutamento di questo personale attraverso lo scorrimento delle graduatorie vigenti e sui vuoti e disomogeneità nelle piante organiche di Asl e ospedali “che determinano una disparità di trattamento tra le varie aziende sanitarie” compromettendo la sicurezza dei cittadini.
“Gli Ordini professionali – si legge nella nota - sono disponibili a collaborare con le Istituzioni per favorire la piena e celere attuazione della normativa vigente e degli indirizzi regionali”. Il riferimento è allo lo scorrimento delle graduatorie attive. Una misura quest’ultima, sollecitata alle Aziende sanitarie dalla stessa Regione con una circolare ad hoc diramata nell’agosto dello scorso anno. La Regione – scrivono i presidenti dei rispettivi Ordini professionali - ha disposto di coordinare le attività per l'utilizzazione delle graduatorie vigenti, a partire da quelle meno recenti dell'Azienda ospedaliera San Pio e dell’ospedale San Sebastiano di Caserta. Una convocazione che fu fissata per il 10 settembre 2025 al fine di procedere all'assunzione, a tempo indeterminato, dei professionisti idonei, in base alle disponibilità indicate nei Piani triennali del Fabbisogno di personale (PTFP) 2024-2026 delle Aziende del Servizio sanitario regionale. “A distanza di oltre sei mesi da tale convocazione – si legge nella nota - risulta che la procedura di reclutamento abbia subito un significativo rallentamento se non un vero e proprio stallo. Non tutti i posti indicati come disponibili sono stati coperti. Tale situazione, oltre a non soddisfare il fabbisogno di personale dirigente dichiarato dalle stesse Aziende, impedisce di procedere, come previsto, all'utilizzo delle altre graduatorie vigenti, frustrando le legittime aspettative dei professionisti idonei e, soprattutto, lasciando sguarnite posizioni di cruciale importanza per il corretto funzionamento del nostro sistema sanitario”.
Una lacuna che ha ripercussioni definite gravi sull’organizzazione sanitaria e sulle risposte ai bisogni di assistenza infermieristica, ostetrica, riabilitativa, tecnico-sanitaria e della prevenzione, in termini di appropriatezza, qualità ed efficacia e sulla capacità di garantire il rispetto dei Livelli essenziali di assistenza (LEA) e degli standard qualitativi e organizzativi previsti a livello nazionale e regionale. “Nelle intenzioni del Legislatore – conclude la nota congiunta - sia nazionale che regionale, i dirigenti delle professioni sanitarie costituiscono la spina dorsale delle aziende sanitarie e ospedaliere; essi partecipano alla definizione della mission aziendale e, nell'ambito dell'organizzazione della struttura, gestiscono una quota preponderante del personale che oscilla tra il 60% e il 70%. La loro assenza, o la loro insufficiente presenza, depotenzia la capacità di governo clinico-assistenziale e di gestione delle risorse umane e materiali”.
In sintesi la mancanza di tali figure si traduce in una vulnerabilità delle reti di cura del sistema sanitario pubblico aggravata dalla disomogeneità delle scelte compiute dai vari manager laddove alcune realtà sono dotate di tali figure dirigenziali e altre ne sono ancora prive, ovvero articolate attorno ad una sola figura anziché divise per aree professionali come previsto dalle norme. “Ciò determina – si legge infine - una disparità di trattamento difficilmente comprensibile che, a valle, si riflette inevitabilmente sulla qualità e sulla sicurezza del servizio offerto ai cittadini, in palese contrasto con i principi di buon andamento e imparzialità dell'azione amministrativa sanciti dall'articolo 97 della Costituzione”.

OpiNapoli informa

Una Consulta permanente dei Cittadini e dei Pazienti

Istituito presso la sede dell'Opi Napoli l'organismo con il quale infermieri e associazioni intendono con tribuire a costruire un sistema sanitario con a centro il cittadino. Sarracino: "Vogliamo onorare in maniera operativa il nostro impegno civico"



Le associazioni di pazienti e il terzo settore giocano un ruolo fondamentale nel sistema sanitario italiano. Queste organizzazioni agiscono come ponte tra i pazienti, le istituzioni e il sistema sanitario, con l'obiettivo di migliorare la qualità dell'assistenza e l'accesso alle cure. Obiettivi condivisi con la professione infermieristica, che ha voluto affermare la centralità del cittadino nel processo di cura nello suo stesso codice deontologico. È su questo idem sentire che alcune Associazioni di pazienti hanno incontrato i vertici dell'Opi Napoli per riaffermare questi principi e per dare maggiore forza alle istanze condivise.
"Gli infermieri devono poter svolgere in maniera più esplicita e riconosciuta quell'importante funzione di educatori, non solo in ambito assistenziale, ma anche come facilitatori in ambito di tele assistenza e con una particolare attenzione alla formazione dei caregiver" dicono le associazioni, In particolare su materie come: invecchiamento della popolazione, gestione delle cronicità, qualità della vita dei più fragili, prevenzione. Con un unico obiettivo: offrire cure infermieristiche a cittadini e famiglie coerenti con le più aggiornate evidenze scientifiche disponibili, migliorando, per questa via, gli esiti sui pazienti".
Sono queste le finalità e le motivazioni alla base della neo istituita "Consulta dei cittadini e dei pazienti" presso la sede dell'Opi Napoli, alla presenza della presidente Teresa Rea e dei coordinatori dell'iniziativa Franca Sarracino, Alessandro Serrano, Andrea Zibaldo, e dei referenti delle Associazioni Aistom, Cittadinanza Attiva, Compagni di Viaggio, Piccolo Grande Amore, Simitu e Vivi l'Epilessia.
"Vogliamo costruire una rete sempre più ampia e operosa tra professionisti e associazioni per onorare un antico e strategico patto tra infermieri e cittadini e per svolgere sempre al meglio il nostro lavoro orientato da sempre a tenere i pazienti al centro del sistema sanitario nazionale", ha detto Franca Sarracino.
La cornice di tutto questo dovrà necessariamente essere l'introduzione di nuovi livelli essenziali di assistenza e l'aggiornamento di quelli esistenti per non lasciare indietro cronicità (in Italia ne sono affetti circa 24 milioni di persone) e patologie rare (i malati rari sono tra i 2 e 3,5 milioni). Centrale in questo scenario l'affermazione della figura dell'infermiere di famiglia, di comunità, sul territorio per garantire la continuità ospedale-territorio, l'aggiornamento professionale continuo, mirato a obiettivi specifici per la tutela della salute dei pazienti e l'organizzazione dei servizi che va comunque rivista secondo criteri di qualità e professionalità per mettere in grado gli infermieri specialisti anche di gestire una filiera di operatori intermedi per garantire la presenza h24 a fianco dei cittadini.

COORDINAMENTO OPI CAMPANIA

La presidente Rea eletta Coordinatrice regionale

È stata eletta all'unanimità la prof Teresa Rea quale coordinatrice regionale Opi Campania. Nella stessa seduta sono stati eletti sempre all'unanimità, il Vice presidente con delega alla Tesoreria il dott. Rocco Cusano (presidente Opi Avellino) e Segretario la d.ssa Francesca Olivieri (Presidente Opi Benevento). Alla riunione d'insediamento hanno preso parte il dott. Gennaro Mona (Presidente Opi Caserta) e il dott Cosimo Cicia ((Presidente Opi Salerno) anche in qualità Presidente Anziano.
Nel corso dell'incontro si è sottolineata l'importanza del coordinamento tra le cinque province della Campania per dare maggiore peso alle politiche professionali in ambito regionale. Tra i temi principali individuati dai cinque presidenti quello della valorizzazione delle competenze infermieristiche, dell'occupazione e della maggiore partecipazione degli infermieri alla definizione e programmazione delle politiche sanitarie regionali.
"Accolgo con molto entusiasmo, ma anche con il necessario senso di responsabilità, questa prestigiosa carica". Ha detto la presidente Opi Napoli e neo coordinatrice regionale Teresa Rea. "Ringrazio i colleghi presidenti per la fiducia accordatami – ha aggiunto - e condivido con loro l'opportunità da cogliere con il varo della Federazione regionale per un più adeguato riconoscimento della professione infermieristica ai tavoli della programmazione sanitaria regionale. Tutti noi insieme a livelli regionale costituiamo una forza di circa 45mila iscritti.
Ovvero, senza infermieri anche in Campania non potrebbe esistere una sanità pubblica, equa e universale".

OpiNapoli informa

LONG TERM CARE

L'allarme OCSE, alle porte un'emergenza assistenziale

L'Organizzazione per la Cooperazione e lo Sviluppo Economico ha lanciato già l'allarme: l'assistenza agli anziani: potrebbe far saltare il welfare. La situazione in Italia. Tra carenza di personale, declino delle cure familiari, la sostenibilità dei sistemi di assistenza si giocherà sulle riforme dei prossimi anni. Il ruolo cruciale degli infermieri.

di **Nina De Martino**

L'allarme è stato lanciato: la spesa per la long-term care è destinata a raddoppiare entro il 2050 in tutti i Paesi Ocse. Arrivando a punte del 2,8% del prodotto interno lordo, quasi il doppio rispetto ai livelli attuali. E la forte impennata dei costi potrebbe mettere in crisi i sistemi welfare occidentali. Stiamo parlando dei costi destinati a quell'insieme di servizi sanitari e sociali rivolti agli anziani non autosufficienti.

Non solo età - Un aumento delle spese persistente. Nei Paesi Ocse la quota di popolazione anziana è in costante aumento e, soprattutto, è destinata a crescere rapidamente la fascia degli over 80, quella con i bisogni assistenziali più complessi. Ma ciò che preoccupa gli analisti dell'istituto parigino è altro. Il primo riguarda la natura stessa dei servizi di cura. L'assistenza agli anziani è un'attività ad alta intensità di lavoro umano, difficilmente automatizzabile. Questo significa che la produttività cresce poco, mentre i salari tendono ad allinearsi a quelli di altri settori più dinamici. È il cosiddetto "effetto Baumol", uno dei principali motori dell'aumento dei costi nel lungo periodo.

Il sociale - Il secondo fattore è sociale. Per decenni, una parte significativa dell'assistenza è stata garantita in modo informale dalle famiglie, in particolare dalle donne. Oggi questo modello è in rapido cambiamento: l'aumento dell'occupazione femminile e le trasformazioni delle strutture familiari riducono la disponibilità di caregiver informali, spostando la domanda verso servizi professionali, più costosi ma anche più strutturati. A questi elementi si aggiunge un terzo: l'aumento del numero di persone in condizioni di dipendenza, legato sia alla maggiore longevità sia alla sopravvivenza più lunga con malattie croniche. In altre parole, non si vive solo più a lungo, ma spesso con bisogni assistenziali più prolungati.

Cosa Fare – L'OCSE pensa che politiche statali orientate alla prevenzione possano evitare la lievitazione dei costi e il rischio default dei paesi associati. Ritardare l'insorgenza della non autosufficienza significa infatti comprimere la durata dei periodi di bisogno assistenziale. Allo stesso modo, interventi sull'organizzazione del lavoro, sull'uso della tecnologia e sull'integrazione tra servizi sanitari e sociali possono migliorare la produttività e contenere i costi. La combinazione di queste leve può arrivare a ridurre fino a un quarto dell'aumento previsto della spesa. Un dato che ribalta la narrativa fatalista: non è la demografia a determinare il destino dei sistemi di LTC, ma la capacità dei governi di governarla.

Il vero nodo, allora, è politico e organizzativo. Significa pianificare per tempo la domanda futura, investire nella formazione e nel reclutamento di personale – oggi già insufficiente in molti Paesi – e costruire modelli di assistenza più integrati e sostenibili.

Emergenza Italia - Per l'Italia, il tema è ancora più urgente. Con una delle popolazioni più anziane al mondo e una forte dipendenza dall'assistenza familiare, il Paese si trova in una posizione particolarmente esposta. La transizione verso un sistema più strutturato di long-term care è già in atto, ma procede lentamente e in modo disomogeneo. Il rischio, senza un cambio di passo, è quello di arrivare impreparati all'appuntamento con il 2050: più anziani, più bisogni, meno caregiver informali e un sistema pubblico sotto pressione.

Gli infermieri – Per la Fnopi un ruolo cruciale per affrontare il problema tocca direttamente la professione infermieristica. A patto che si riveda completamente il sistema. "La sanità moderna – ha sottolineato di recente la Presidente Barbara Mangiacavalli - non può più basarsi su singole professionalità che lavorano in modo isolato, ma deve essere organizzata in team multidisciplinari e integrati".

Che fine ha fatto la riforma?

La prima domanda che viene da farsi per comprendere come l'Italia si stia preparando per affrontare in sicurezza l'impennata di ultraottantenni in condizioni di multimorbilità e non autosufficienti è questa: a che punto siamo nell'attuazione della tanto attesa riforma nazionale dell'assistenza agli anziani non autosufficienti? La riforma è stata introdotta nella primavera del 2023 attraverso la Legge Delega 33/2023. Una normativa ampiamente sostenuta dagli addetti ai lavori perché basata sugli insegnamenti provenienti da quanto avvenuto sinora nel nostro Paese. La Legge 33 propone uno sguardo d'insieme alla non autosufficienza e intende, dunque, affrontare le maggiori criticità del settore.

Tre obiettivi - Lo si evince nitidamente dai suoi tre obiettivi principali. Primo, la costruzione di un sistema unitario: superare l'attuale frammentazione delle misure pubbliche, dislocate tra servizi sanitari, servizi sociali e trasferimenti monetari nazionali non coordinati tra loro, con una babele di diverse regole e procedure da seguire. Secondo, la definizione di nuovi modelli d'intervento. Non di rado, quelli oggi esistenti sono stati progettati molti anni fa secondo logiche ormai superate dalla realtà e inadeguate ad affrontare il futuro. Terzo, l'ampliamento dell'offerta di servizi alla persona, domiciliari, intermedi e residenziali, che risultano oggi insufficienti. Quindi, un sistema integrato che persegua nuovi modelli d'intervento. L'offerta consiste perlopiù nell'assistenza domiciliare integrata (ADI) delle Asl, che in prevalenza dura tre mesi nonostante la non autosufficienza si protragga spesso per anni. Vengono fornite singole prestazioni infermieristiche ma fuori da una presa in carico complessiva dell'anziano. Detto altrimenti, l'ADI è un servizio utile ma non pensato per affrontare l'insieme dei differenti problemi che questa complessa condizione di vita pone.

Ospedali & territorio

L'AORN Santobono-Pausilipon diventa ente nazionale di ricerca

FONDAZIONE SANTOBONO PAUSILIPON

LA SANITÀ

Il presidio Santobono Pausilipon entra ufficialmente nella rete IRCCS: «Avvio di una nuova fase di crescita»

Fico: «Un traguardo che premia il percorso e gli sforzi»

Con la pubblicazione in Gazzetta ufficiale del decreto del Ministro della Salute Orazio Schillaci, l'AORN Santobono Pausilipon entra nella rete degli Istituti di Ricovero e Cura a Carattere Scientifico (IRCCS) per l'area della Pediatria. "Questo traguardo rappresenta non solo un importante riconoscimento istituzionale, ma anche l'avvio di una nuova fase di sviluppo, caratterizzata dal rafforzamento delle attività di ricerca, dall'accesso a specifici finanziamenti e da una crescente integrazione tra assistenza clinica e innovazione scientifica. l riconoscimento come Irccs dell'Aorn Santobono-Pausilipon non è soltanto un traguardo formale, ma il consolidamento di un patrimonio di competenze cliniche, assistenziali e scientifiche costruito nel tempo a beneficio dei bambini e delle loro famiglie. Un percorso d'eccellenza nel quale gli infermieri hanno svolto in tutti questi anni un ruolo da protagonisti". Ha commentato cosi Maria Grimaldi, presidente della Commissione d'Albo infermieri pediatrici dell'Opi Napoli – anche a nome dell'intera commissione – il passaggio dell'Aorn Santobono-Pausilipon da Azienda ospedaliera monospecialistica di rilievo nazionale di alta specializzazione a Istituto di ricovero e cura a carattere scientifico (Irccs). Il nuovo e prestigioso status rafforza, inoltre, il ruolo dell'ospedale come luogo di integrazione tra assistenza, ricerca e formazione. In questo modello, le professioni infermieristiche e gli infermieri pediatrici in particolare, svolgono una funzione strategica: dalla continuità assistenziale alla ricerca clinica, dall'educazione terapeutica alla partecipazione ai percorsi di innovazione organizzativa e scientifica tutto ciò sempre mantenendo alta l'attenzione verso l'etica e la relazione di cura. Il nuovo prestigioso status porrà il Santobono-Pausilipon al vertice degli istituti di eccellenza in campo pediatrico come il Bambin Gesù di Roma, il Meyer di Firenze e il Gaslini di Genova. "Lo status di Irccs – si legge inoltre nella nota dell'Opi Napoli - consentirà di rafforzare il legame strutturale tra assistenza clinica, ricerca scientifica e innovazione, ponendo al centro un modello di cura avanzato che non può prescindere dal contributo delle professioni infermieristiche". Negli Irccs, infatti, l'infermiere non è solo erogatore di assistenza, ma professionista chiave nei processi di qualità, sicurezza delle cure, ricerca clinica e sperimentazione, con competenze sempre più specialistiche e integrate nei team multiprofessionali. In più, lo status di Irccs garantirà all'Istituto più risorse economiche e più assunzioni.

Ospedale Cardarelli, nuova Medicina di Urgenza e Utic

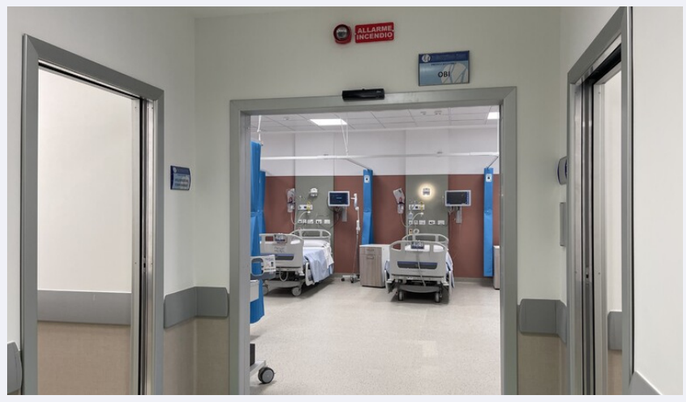
I cittadini della regione Campania possono contare su un nuovo reparto di medicina di Emergenza ed Urgenza ed un reparto Utic all'avanguardia non solo nella gestione assistenziale, ma anche nell'organizzazione degli spazi e nelle tecnologie. Le due nuove strutture si trovano presso l'ospedale Antonio Cardarelli di Napoli, un punto di riferimento assoluto per la gestione dell'emergenza e per i pazienti che non trovano risposte in altri ospedali della regione; da gennaio a marzo, infatti, sono stati ben 571 i cittadini (di cui 345 provenienti da ospedali pubblici) che, dopo un passaggio in altre strutture sanitarie campane, hanno fatto ricorso alle cure in emergenza del Cardarelli. Il reparto di Medicina di Urgenza è una novità assoluta per la gestione dell'emergenza-urgenza al Cardarelli. L'ospedale napoletano, infatti, nonostante registri ogni anno oltre 70.000 accessi in Pronto Soccorso non era dotato di uno specifico reparto di Medicina di Urgenza, una vera anomalia organizzativa nel panorama degli ospedali italiani. La realizzazione del nuovo reparto è avvenuta in un'area del padiglione L che era stata oggetto di sequestro nel 2008 da parte della magistratura, a seguito di gravi inadeguatezze strutturali. L'intervento edilizio ha richiesto un impegno economico di circa 1 milione di euro. La nuova struttura e' dotata di sedici posti letto ordinari e di un posto letto in isolamento e rappresenterà il continuum con la struttura del Pronto Soccorso-OBI. In questo reparto, infatti, saranno trattati i pazienti che, dato il loro quadro clinico complesso, non possono essere ancora dimessi dalla struttura di prima emergenza verso reparti ordinari. L'attivazione del nuovo reparto nasce dall'esigenza di offrire una risposta ancora piu' strutturata all'affluenza in termini di numeri e complessità assistenziale che fa registrare il Pronto soccorso del Cardarelli ed e' stata resa possibile anche dalla disponibilita' di giovani medici a partecipare all'ultimo concorso per medici dell'emergenza. La nuova struttura dedicata all'Unità di Terapia Intensiva Coronarica e' dotata di 8 posti letto, organizzati in singole capsule in cui i pazienti saranno monitorati dal personale del reparto presso una consolle centrale. La nuova area di accoglienza dei pazienti garantisce il massimo della sicurezza e della privacy e condizioni di lavoro ottimali per il personale. Inoltre, presso il reparto di Cardiologia con Utic e' stata allestita una nuova sala di emodinamica che si aggiunge alle due già in uso all'interno del Pronto Soccorso per la gestione delle emergenze cardiologiche. La terza sala di emodinamica permetterà di aumentare la possibilità di effettuare interventi di cardiologia interventistica in elezione, aumentando le capacità di assistenza dell'ospedale.

Ad Acerra l'ambulatorio popolare "San Giuseppe Moscati"

Un segno concreto di vicinanza ai più fragili, frutto del Giubileo della Speranza appena terminato, una "carezza" della Chiesa a chi soffre e ha bisogno di cura. Ad Acerra nasce l'Ambulatorio Popolare "San Giuseppe Moscati", iniziativa dal forte significato e impatto sociale in un territorio gravato da anni dall'inquinamento ambientale, con l'insorgere di patologie tumorali in particolare tra giovani e ragazzi. La struttura sarà inaugurata sabato alle ore 10. Avrà sede nei locali del seminario vescovile in piazza Duomo. Interverranno il vescovo, Antonio Di Donna e il direttore nazionale della Caritas italiana, don Marco Pagniello. Il presidio sanitario è perciò una piccola ma preziosa goccia di speranza per le tante persone in condizioni socioeconomiche difficili, spesso costrette a scegliere se curarsi, pagare le utenze o comprare beni alimentari: mentre le lunghe liste di attesa nella sanità pubblica rendono ancora più difficile l'accesso alle visite specialistiche per chi ha meno possibilità. L'ambulatorio popolare "San Giuseppe Moscati" nasce grazie all'impegno pastorale del vescovo di Acerra, monsignor Antonio Di Donna, che ha messo a disposizione i locali del Seminario in Piazza Duomo, ristrutturati e adeguati con i fondi del progetto "Intesa Salute" di Caritas Italiana. Un ecografo, donato dalla locale Clinica Villa dei Fiori, consentirà di effettuare screening specialistici al seno, alla prostata e all'addome. Disponibili ecocardiogramma ed elettrocardiogramma, visite di medicina generale e pediatriche, grazie all'impegno gratuito di medici volontari. All'interno anche uno sportello dedicato ai disturbi alimentari, realizzato in collaborazione con l'associazione Emmepi4ever.

Ospedale Avellino, a breve nuovo pronto soccorso

Prosegue il progetto di ristrutturazione integrale del Pronto soccorso dell'Azienda ospedaliera San Giuseppe Moscati di Avellino, un intervento strategico che porterà, spiega una nota dell'ospedale, al raddoppio della superficie complessiva dell'area dell'emergenza. Al termine dei lavori la struttura passerà dagli attuali 1.040 metri quadrati a 2.515, con ambienti completamente riqualificati, più funzionali per il personale sanitario e più confortevoli per pazienti e accompagnatori. Un passaggio fondamentale di questo percorso sarà compiuto domani, mercoledì 18 marzo, quando sarà consegnata la nuova superficie di 1400 metri quadrati e si procederà, contestualmente, al graduale trasferimento dei servizi dalla precedente area di circa mille metri quadrati. Le attività del Pronto soccorso, che in questi mesi non si sono mai fermate e non possono fermarsi, continueranno a essere garantite senza interruzioni, nonostante la complessità organizzativa dell'operazione. Nella nuova ala del Pronto soccorso troveranno posto: sala trattamento e visita, zona dedicata ai pazienti in attesa di ricovero, stanza per pazienti fragili, stanza per detenuti, ambiente riservato alle vittime di violenza, area per pazienti con patologie infettive e area Obi - Osservazione Breve Intensiva, fondamentale per la gestione dei casi che richiedono monitoraggio clinico prolungato. Con il trasferimento programmato, sarà possibile procedere immediatamente con la ristrutturazione della parte originaria del Pronto soccorso, oggetto di completo rifacimento e integrazione con la nuova. In questa fase, il triage, la sala d'attesa per i familiari e l'area codice rosso continueranno a rimanere operativi negli spazi attuali e saranno oggetto di intervento solo nell'ultima fase dei lavori. Lo spostamento pianificato segna un momento strategico e simbolico: consente di intervenire sulla vecchia superficie senza interferire sulle attività e rappresenta una tappa concreta verso il completamento dell' intero progetto. Il rispetto del cronoprogramma conferma l'impegno assunto e si avvicina la consegna definitiva di un Pronto soccorso completamente rinnovato, adeguato alle esigenze assistenziali dell'Azienda ospedaliera Moscati, riferimento per Avellino e per l'intero territorio provinciale e limitrofo.



Ospedale Frattamaggiore, nuovi reparti, più servizi

Un reparto di cardiologia potenziato e ristrutturato; una seconda Tac con l'intelligenza artificiale e la ginecologia, operativa h 24, con una nuova sala operatoria: il San Giovanni di Dio è tra le eccellenze degli ospedali regionali. Un ospedale all'epicentro di un'area tra due province, 600mila abitanti, una altissima densità (18.000 abitanti per chilometro quadrato), un pronto soccorso da 46mila accessi all'anno (130 al giorno).

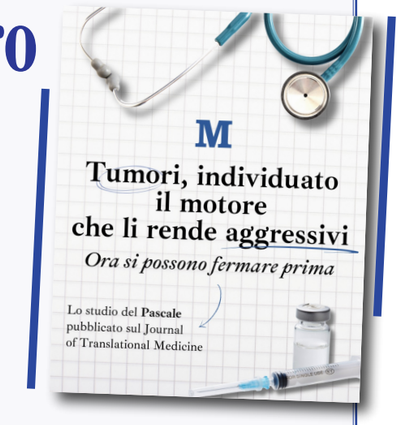
I reparti - La cardiologia (600 prestazione nel 2025, 11 posti letto), è stata ristrutturata ma anche potenziata con una nuova sala di elettrofisiologia ed elettrostimolazione. L'ampliamento del reparto contribuisce a migliorare il livello delle cure, anche dal punto di vista logistico laddove le stanze singole e doppie doneranno comfort alla degenza. E poi abbiamo una sala operatoria attrezzata per soddisfare ogni esigenza dell'elettrostimolazione, dai pacemaker ai defibrillatori fino all'ablazione delle aritmie più complesse. il nuovo reparto di cardiologia consentirà tra l'altro procedure di aritmologia avanzata in un contesto di sterilità e precisione tecnologica. L'implementazione della seconda TAC dotata di intelligenza artificiale consentirà di ridurre i tempi e ottenere maggiore precisione nella diagnosi. Anche la ginecologia (600 parti all'anno, l'80 per cento spontanei), è stata investita da un processo di umanizzazione, (un murales dell'artista Trisha sul «percorso della cicogna»), senza trascurare la sicurezza, con la nuova sala operatoria al piano per le urgenze e la sala contumacia. «L'umanizzazione - spiega il primario Galante - è fondamentale nell'assistenza alla mamma e al bambino nei primi momenti di vita. Siamo riusciti a coniugare un percorso di accoglienza confortevole con la sicurezza delle cure».

Novità anche nella diagnostica - La seconda Tac disporrà di IA. La Radiologia oltre a tutte le procedure in urgenza esegue screening di secondo livello del carcinoma del colon retto, screening delle malattie cardiovascolari sia per i pazienti ricoverati che ambulatoriali. La seconda Tac ha ottimizzato inoltre gli esami, consentendo di avere immagini di ottimo livello grazie all'intelligenza artificiale ma riducendo allo stesso tempo anche la dose per paziente.

Ospedale del mare, mastectomia endoscopica nipple-sparing

L'Ospedale del Mare, comunica l'Asl NAPOLI 1 Centro, "è il primo centro in Campania ad aver adottato la tecnica di mastectomia endoscopica capezzolo-sparing e-NSM (mastectomia endoscopica con preservazione del capezzolo) collocandosi tra le realtà più innovative grazie a competenze endoscopiche avanzate, a un orientamento all'innovazione tecnologica, rappresentando oggi un punto di riferimento per la Chirurgia Senologica in Campania". Grazie allo sviluppo delle competenze endoscopiche e all'infrastruttura tecnologica presente, l'unità operativa semplice dipartimentale di Chirurgia Senologica diretta da Antonio Marano "rappresenta uno dei primi centri in Campania ad adottare e sviluppare approcci chirurgici mininvasivi avanzati applicabili anche alla chirurgia mammaria". Infatti, "la contemporanea presenza dell'equipe della unità operativa semplice dipartimentale di Chirurgia Plastica, diretta da Alfredo Borriello, consente la ricostruzione immediata con protesi. Basilare anche la collaborazione e la sinergia con la unità operativa complessa di Anestesia e Rianimazione e di tutto il personale del blocco operatorio dell'Ospedale del Mare, diretta da Ciro Fittipaldi". La mastectomia endoscopica capezzolo-sparing (e-NSM) è una tecnica chirurgica relativamente nuova e ancora in evoluzione nel trattamento del tumore al seno e nella chirurgia profilattica per predisposizione al tumore della mammella su base ereditaria, nelle donne con mutazione genetica accertata. In pratica è una mastectomia mininvasiva che rimuove tutta la ghiandola mammaria, preserva la cute, l'areola e il capezzolo utilizzando strumenti endoscopici (telecamera + strumenti sottili) a cui segue una ricostruzione diretta con protesi. I principali vantaggi che vengono ottenuti sono un migliore risultato estetico e psicologico (meno cicatrici visibili), un recupero più rapido con meno dolore, la possibile migliore conservazione della sensibilità del capezzolo e l'alta soddisfazione dei pazienti per il risultato finale.

Pascale, individuato il "motore" dell'aggressività del cancro



I tumori non nascono all'improvviso, ma si sviluppano lentamente, spesso senza dare segnali per anni, fino a quando qualcosa cambia e la sua crescita diventa più rapida e pericolosa.

Uno studio dell'Istituto dei tumori Pascale di Napoli, insieme alla Vanvitelli, alla Cattolica del Sacro Cuore di Roma, e alle Università di Messina e di Salerno, pubblicato sul Journal of Translational Medicine, ha analizzato proprio questo paesaggio importante. Il lavoro descrive il momento in cui il tumore subisce questo "cambio" spiegando cosa succede in quel momento chiave e lo fa con un'immagine semplice: un "motore" che si accende. Secondo l'oncologo del Pascale, Alessandro Ottaiano, prima firma dello studio multicentrico, esiste una fase iniziale e silenziosa in cui le cellule accumulano piccoli errori nel DNA, le cosiddette mutazioni, ma senza effetti visibili. In questo stadio i meccanismi di difesa dell'organismo riescono ancora ad intervenire e riparare i danni. La situazione cambia quando questi sistemi iniziano a funzionare meno. È in quel momento che si attiva il "motore": le cellule tumorali diventano più aggressive, crescono più in fretta e prendono il sopravvento. .L'integrazione tra analisi genetiche e intelligenza artificiale, inoltre, può permettere di prevedere l'evoluzione della malattia e scegliere terapie sempre più personalizzate. L'obiettivo, in prospettiva, è cambiare approccio: non solo eliminare le cellule tumorali, ma bloccare il "motore"che le rende più aggressive, cercando di rallentare o fermare la progressione della malattia. "Il tumore è, in fondo, un processo evolutivo accelerato - spiega Alessandro Ottaiano - Quello che in natura richiederebbe migliaia di anni, qui avviene in tempi rapidissimi. Le cellule più adatte a sopravvivere si selezionano, si moltiplicano e finiscono per dominare l'ambiente circostante. Questa teoria non cambia le cure da domani mattina, ma sposta il bersaglio: non solo distruggere il tumore, ma impedirgli di accelerare. Capire questo passaggio può fare la differenza.

Perché significa individuare quando il tumore sta per cambiare marcia e intervenire prima, con terapie più mirate". Non solo combattere il tumore, quindi, ma impedirgli di accelerare. "In questo processo - continua Ottaiano - resta fondamentale la prevenzione. Alimentazione sana, attività fisica, niente fumo e attenzione alle sostanze nocive possono ridurre il numero di mutazioni e quindi il rischio. Perché fermare il tumore, oggi, significa anche evitare che quel motore nascosto abbia la possibilità di accendersi.

SELF-CARE KNOWLEDGE, BEHAVIORAL PRACTICES, AND PREVENTIVE STRATEGIES FOR DIABETIC FOOT ULCERS AMONG INDIVIDUALS WITH DIABETES IN TERTIARY HOSPITALS IN NIGERIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: The increasing prevalence of diabetes is a global public health concern, with foot ulcer prevention techniques, low self-care knowledge, and a lack of confidence contributing to complications like foot ulcers.

Methods: This cross-sectional study, conducted between January and December 2022, evaluated foot self-care knowledge, self-efficacy, and self-care behaviors among individuals with diabetes attending public tertiary hospitals in Abeokuta, Nigeria. Data from randomly selected 120 out-patients was collected using a multidimensional questionnaire, and multiple regression analysis was used to assess associations between variables.

Results: It was found that participants' mean age was 44.8±14.65 years. Majority (58.3%) of them did not attend foot self-care education classes and had received a type-2 diabetes diagnosis within the previous 24 months. Many of the patients had low knowledge of foot self-care (55%), low self-care efficacy (55%) and poor self-care behavior (55%). Poor self-care behavior was predicted by low efficaciousness ($p<0.0001$) and low knowledge of foot self-care ($p<0.0001$).

Conclusion: The study concluded that the extent of knowledge significantly influenced self-care behaviors and the efficacy of foot self-care in averting diabetic foot ulcers. Improving these behaviors requires teaching appropriate knowledge through hands-on self-care treatments and gaining support from policymakers for its sustainability.

Keywords: Diabetes Foot Ulcer, Self-Care Knowledge, Efficacy, Behavior, Confidence.

INTRODUCTION

With an increasing prevalence, diabetes mellitus has become a global public health concern [1]. It raises mortality, illness, and medical expenses [1,2]. There are 537 million adults (20–79 years old) worldwide with diabetes as reported by International Diabetes Federation (IDF) [1]. Conversely, by 2060, the incidence of diabetes is expected to increase to 700% for type II and 65% for type I, according to the Centers for Disease Control and Prevention [3]. Additionally, diabetes is thought to be the cause of 6.7 million fatalities annually [1], with 1.5 million of those deaths occurring primarily in low- and middle-income nations [4].

According to IDF data from 2021, 1 in 22 adult Africans has diabetes, and 54% of Africans have diabetes but have not been diagnosed [1]. In Nigeria, the prevalence of diabetes rose from 2.2% in 1997 to over 6% in 2015, a more than 100% increase, according to World Health Organization (WHO) [5]. The IDF stated that the sub-Saharan region had the greatest estimated prevalence of diabetes, at 3,623,500 (3.7%). The prevalence rates of diabetic foot ulcers (DFU) in Nigeria vary from 11% to 32%, according to Ugwu et al. [6]. The rising rate of diabetes in Nigeria has been mostly linked to demographic shifts, including urbanization, the adoption of unsafe habits, poor diets that include sugar-sweetened beverages, inactivity, and dangerous alcohol and tobacco use [5,6]. This has also led to complications such as diabetic foot ulcers. This necessitates investigating the level of knowledge of people with diabetes mellitus (PWDM) on foot ulcer preventive self-care activities in selected hospitals in Abeokuta.

Millions of individuals worldwide are impacted by the dangerous side effect of diabetes called diabetic foot ulcers. It is lethal and can cause gangrene, infection, ischemia problems, neuropathy, macrovascular disease, and microvascular damage. According to Robles et al. [7], DFU is a challenging, expensive, and chronic health problem that increases morbidity and death. According to Oliver and Mutlouglu [8], ulcers are typically persistent and can occur in inpatient as well as outpatient environments. An array of variables, such as male gender, diabetes for over a decade, the

NSC Nursing 2026, Volume 1, Nr. 1 pp 1-31

advanced age of the patients, obesity, dry skin, insufficient circulation, underpinning nerve damage, callus formation, foot defects, improper foot hygiene, and poorly fitting shoes, are linked to the development of DFU, according to Khan, Khan, & Farooqui [9] and Oliver & Mutlouglu, [8]. Despite being controllable through education, it is the most costly and fatal event related with lower extremity amputation (LEA) and frequently associated with high morbidity and death [6]. Families and societies are consequently forced to bear a greater financial burden [10,11]. Other adverse effects include poor quality-of-life [12, 13]. In light of these burdens, it is important to assess how confident PWDM are in their ability to avoid foot ulcers in the selected hospitals. Therefore, this study assumes there is no significant association between efficacy and behavior of PWDM.

According to Sari et al. [14], poor foot self-care is the main factor contributing to DFU, while appropriate foot self-care can cut the risk of DFU, hospital stays, and amputations by 50%. Client-focused education on self-efficacy in FSC practices should be promoted in a time- and cost-effective manner, as continuous physician supervision is not always possible [15]. For this reason, Adeyemi et al. [16] proposed that appropriate foot care methods and patient education can avoid or lower the risk for DFU in the interim. Previous studies [9,14,17,18] revealed low to moderate foot care practice, inadequate understanding of DFU, and attitudes toward foot care prevention. People with diabetes mellitus in Sub-Saharan Africa also showed fair but insufficient awareness of diabetic foot care [19]; this is comparable to what is available in other parts of the world. Research on effective FSC behavior is still limited, and incidence of DFU, limb loss, and DFU-related premature death have increased in Nigeria. Similar to what was found by Ojewale, Okoye, and Ani [20], their study on FSC behavior and self-efficacy among PWDM in the University College Hospital, Nigeria, revealed a scarcity of investigations. Consequently, research on PWDM self-care knowledge, efficacy, and behavior is crucial. It is therefore important to explore the foot self-care behavior of PWDM in selected hospitals. In line with this, the study tested the hypothesis that there is no significant association between age, gender, educational status and behavior of FSC among

PWDM, and that there is no significant association between knowledge of FSC and the behavior of PWDM. Thus, with the goal to prevent foot ulcers, this study assessed PWDM's self-care knowledge, efficacy, and behavior.

MATERIALS AND METHODS

Study design

This is a cross-sectional descriptive study which assessed the FSC knowledge, self-care efficacy and behavior of PWDM toward DFU prevention in Federal Medical Hospital (FMC), and State Hospital, Ijaiye, Abeokuta, Nigeria, between January and December 2022.

Target population

This included PWDM (type 1 and 2) in the selected hospitals.

Study population

PWDM who attended outpatient clinics, who were estimated to be 200 monthly in FMC, and 120 monthly in the State Hospital, Ijaiye, Abeokuta, respectively.

Inclusion criteria

Adult PWDM male and female aged 18 years and above managed for at least three months, that attended OPD clinic of FMC and State Hospital, Ijaiye, Abeokuta and gave consent to participate were included in the study.

Exclusion criteria

PWDM with existing DFU, those critically ill, and those on admission were excluded from the study.

NSC Nursing 2026, Volume 1, Nr. 1 pp 1-31

Sample size estimation

The minimum sample size was determined using Cochran's formula for estimating proportions in large populations:

$$n = \frac{Z^2 pq}{e^2},$$

where:

n_0 = initial sample size, Z = standard normal deviation at 95% confidence (1.96), p = estimated proportion of the population with the attribute, $q = 1 - p$, e = desired margin of error.

Since no prior prevalence estimate of foot-care knowledge among individuals with diabetes in Abeokuta was available, the study used $p = 50\%$. This value is conventionally used when there is insufficient prior data, as it maximizes sample size and increases precision. The margin of error was set at $e = 10\%$. Based on previous values the estimated sample size is:

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{(1.95)^2 (0.5)(0.5)}{(0.1)^2} = \frac{3.8416(0.25)}{(0.01)} \simeq 96$$

Additionally, a 20% attrition rate (AR) was included:

$$n_{adj} = \frac{n_0}{(1-AR)} = \frac{96}{(1-0.2)} = 120$$

Thus, the final sample size used in this study was 120. Particularly, we adopted a relatively large margin of error (e=10%) and an attrition rate of 20%, as this is an explorative study.

Sampling technique

Two out of the three hospitals in Abeokuta; Federal Medical Center, Abeokuta and State Hospital, Ijaiye were selected using random sampling technique. A total of 120 participants were later

recruited from the 2 hospitals.

Instrument for data collection

Data was obtained from respondents using structured and validated questionnaires, the questionnaire was in three sections. Section A addressed demographic data and knowledge of FSC**.** Section B assessed FSC behavior activities using a validated 26-item self-report tool adapted form of Nottingham Assessment of Functional Foot-care (NAFFS) [21]. While section C addressed the question on foot care efficacy using an adapted 12-item Foot Care Confidence Scale (FCCS) by Sloan Helen L. (2002) [22].

Validity of the instrument

The instrument was subjected to face and construct validity by thorough scrutiny by the researcher's supervisor and expert clinician caring for PWDM and DFU. The multidimensional validated questionnaire containing sections on FCCS and NAFFS was subjected to forward and backward translation to Yoruba and English to ensure their validity. The items in each section of the instrument were further subjected to content validity testing by submitting the instrument to five experts and using Lawshe's formula to ensure the content validity ratio (CVR) for each item in each section of the instrument, resulting in the content validity index (CVI) for each section. According to Ayre and Sally (2013) [23], the CVR (content validity ratio) proposed by Lawshe (1975) [24] is a linear transformation of a proportional level of agreement on how many "experts" within a panel rate an item "essential" calculated in the following way:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}} = \frac{\frac{2n_e - N}{2}}{\frac{N}{2}} = \left(\frac{2n_e - N}{2}\right)\left(\frac{2}{N}\right) = \frac{2n_e - N}{N}$$

CVR is the content validity ratio, n_e is the number of panel members indicating an item "essential," and N is the number of panel members. Just like r, CVR ranges between -1 through 0 to +1. The closer to +1 is CVR for an item; the more valid is the item in the scale while CVR values closer to 0 imply lack of content validity. However, CVI is computed by dividing sum of CVR values by the total number of items. CVI is interpreted for the scale the same way CVR values are interpreted for the items. Table 1 displayed the CVIs for the relevant sections of the multidimensional instrument:

Instrument	Number of Items	Content Validity Index (CVI)	Comment
Foot Self-care Knowledge scale	7	0.84	Valid
FCCS	12	0.76	Valid
NAFFS	26	0.86	Valid

Table 1. *Validity table*

Reliability of the instrument

The reliability of the knowledge part of the questionnaire in section A was established using the Kuder Richardson formula- 20, KR20 conducted on SPSS Version 23 because of the dichotomous nature of the items in the section of the multidimensional instrument. Though the other 2 validated instruments, FCCS and NAFFS reportedly had Cronbach's alpha reliability indices of 0.92 and 0.91 respectively, but all these instruments were revalidated by administering them on a sample of 30 respondents similar to but entirely different from those recruited for the main study. The reliability index obtained for the instruments was > 0.9 (Table 2).

Instrument	Number of items	Cronbach Alpha/KR20	Comment
Foot Self-care Knowledge scale	7	0.972	Sufficiently Reliable
FCCS	12	0.996	Sufficiently Reliable
NAFFS	26	0.997	Sufficiently Reliable

Table 2. *Reliability indices for the variables in the multidimensional instrument*

Method of data collection

After gaining approval from the two institutions' ethical committee, the individual's informed consent, and permission from the head of the OPD at both, the instruments for data collection were given to study participants on clinic days over the course of four months (July to October, 2023), two research assistants attended a two-day training session where they learned about the objectives of the study, the content of foot care and DFU prevention guidelines/standards, FSC behavior and self-efficacy tools, and how to distribute the questionnaires. They were selected from among the registered nurses who care for patients with diabetes and DFU at Sacred Heart Hospital, Lantoro. Targeting their clinic hours on Mondays and Wednesdays, the study settings (FMC and State Hospital, Ijaye, respectively) were visited in the morning. As soon as the surveys were completed, they were gathered. People who were illiterate were helped to complete the surveys by having them translated into their native tongue.

Method of data analysis

Descriptive statistics such as means and standard deviations were used for continuous variables, while frequencies and percentages were used for categorical variables.

Responses to attitudinal or perception-based questions were measured using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). Where applicable, composite scores were computed, and the scale reliability was assessed using Cronbach's alpha.

Inferential statistics, including chi-square tests for categorical variables and independent t-tests or ANOVA for comparing group means, were applied where appropriate.

Statistical significance was set at $p < 0.05$. Data were entered and analyzed using IBM SPSS Statistics version 23.0 (IBM Corp., Armonk, NY, USA).

NSC Nursing 2026, Volume 1, Nr. 1 pp 1-31

RESULTS

One hundred and twenty questionnaires were administered to the respondents, same received and used for analysis.

Characteristics	Categories	n (%)	Mean	SD
Age (years)	21–30	28 (23.3)		
	31–40	24 (20.0)		
	41–50	21 (17.5)		
	51–60	26 (21.7)	44.8	14.65
	61–70	17 (14.2)		
	>70	4 (3.3)		
Gender [a]	Female	85 (70.8)	1.29	0.46
	Male	35 (29.2)		
Marital status [b]	Single	30 (25.0)	2.13	0.90
	Married	55 (45.8)		
	Separated/Divorced	24 (20.0)		
	Widowed	11 (9.2)		
Educational status [c]	No formal education	28 (23.3)	2.55	1.13
	Primary	31 (25.8)		
	Secondary	28 (23.3)		
	Tertiary	33 (27.5)		
Occupation [d]	Unemployed	28 (23.3)	2.53	1.08
	Farming	28 (23.3)		
	Trading	37 (30.8)		
	Civil servant	27 (22.5)		
Type of diabetes [e]	Type 1	50 (41.7)	1.58	0.50
	Type 2	70 (58.3)		
Duration since diagnosis [f]	1–24 months	87 (72.5)	1.47	0.87
	25–48 months	17 (14.2)		
	49–72 months	9 (7.5)		
	>72 months	7 (5.8)		
Previous foot–care education [g]	Yes	50 (41.7)	1.58	0.50
	No	70 (58.3)		
Foot-care frequency [h]	Once a week	16 (13.3)	2.75	1.59
	2–6 times/week	22 (18.3)		
	Once a day	8 (6.7)		
	>1 time/day	4 (3.3)		
	Not applicable	70 (58.3)		
Knowledge of foot care [i]	No idea	72 (60.0)	0.48	0.65
	Moderate idea	38 (31.7)		
	Expert idea	10 (8.3)		
Performs foot care independently [j]	Yes	87 (72.5)	1.28	0.45
	No	33 (27.5)		
**If No, who helps? **[k]	Family	31 (25.8)	2.02	0.98
	Friends	2 (1.7)		
	Not applicable	87 (72.5)		

Table 3. *Sociodemographic characteristics of 120 respondents (Source: Field survey, 2023)*

Table 3 showed the demographic distribution of the respondents. The majority 28 (23.1%) of them are in the age group of 21-30 years, while the 4 (3.3%) that were above 70 years were the least in the distribution with the mean age of 44.8±14.65 years. About three-quarters 85 (70.8%) are female, while 35 (29.2%) are male. The majority were married, 55 (45.8%), and 30 (25%) are single. Most of the respondents had higher education 33 (27.5%), while both illiterates and secondary school completers were 28 (23.3%), respectively. Traders were more than other categories at 37 (30.8%) followed by civil servants at 27 (22.5%).

As shown further in Table 3, more than half 70 (58.3%) of the respondents had T2DM with majority 87 (72.5%) diagnosed within the past 24 months. Findings also revealed that 50 (41.7%) of the respondents had prior attendance at FSC education while 70 (58.3%) had no such experience. A few, 16 (13.3%), 22 (18.3%), 8 (6.7%) and 4 (3.3%) of the participants attended once a month, every other month, whenever chanced, and when reminded respectively, while this was not applicable to 70 (58.3%) of them. The majority, 72 (60.0%) of the participants had no idea know what foot care is, 38 (31.7%) had moderate idea while 10 (8.3%) claimed to have expertise idea. Finally, 87 (72.5%) performed foot care by themselves while 33 (27.5%) did not.

Respondents' knowledge of foot self-care

Item	No	Yes
People with diabetes should check their feet at least once a day	77(64.2%)	43(35.8%)
People with diabetes should inspect their toes, nails, and cut it straight	77(64.2%)	43(35.8%)
The feet should be washed, and lotion applied to moisturize them	77(64.2%)	43(35.8%)
People with diabetes should warm their feet with lantern	66(55%)	54(45%)
Before putting on shoes, people with diabetes should inspect the interior of them	76(63.3%)	44(36.7%)
Foot corn/callus should be removed with razor blade	76(63.3%)	44(36.7%)
People with diabetes should wear shoes that are not too tight	76(63.3%)	44(36.7%)

Table 4. *Knowledge of 120 respondents on foot self-care (Source: Field survey, 2023)*

NSC Nursing 2026, Volume 1, Nr. 1 pp 1-31

From table 4 the majority 77 (64.2%) of the participants declined that, PWDM should check their foot once daily, inspect their toes, nails, and cut it straight and the feet should be washed, and lotion applied to moisturize them. A little above half 66 (55.0%) disagreed with the statement that PWDM should warm their feet with lantern. Additionally, 44 (36.7%) of the respondents indicated that PWDM should wear shoes that are not too tight, remove corns and calluses from their feet with a razor blade, and check the inside of their shoes before wearing them.

Summary of respondents' knowledge about foot self-care

Overall, the mean knowledge score was 9.63±3.08. As shown in Figure 1, 55% of the respondents had low level of knowledge of foot care, 17.5% of them had moderate knowledge while only 27.5% of them had high knowledge of foot self-care.

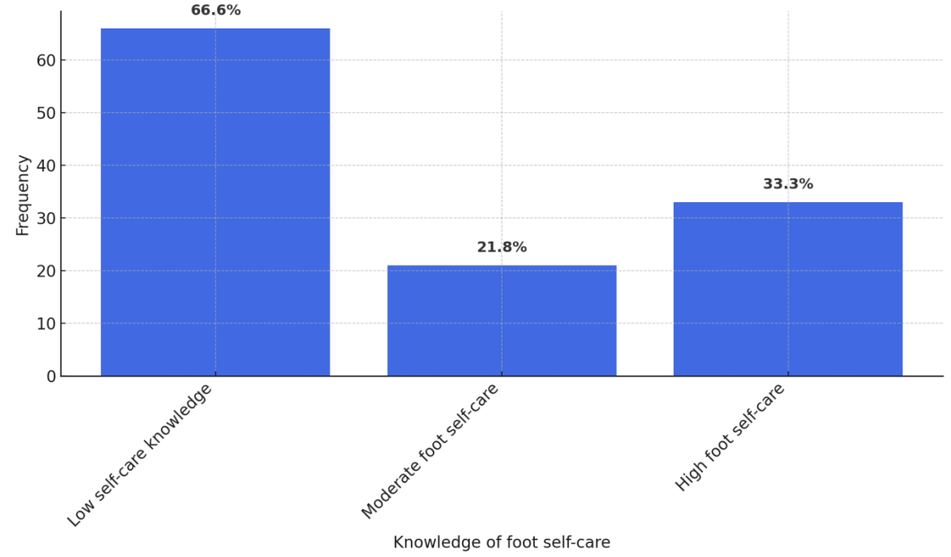

Figure 1. *Respondents' level of knowledge about foot self-care*

Self-efficacy to practice foot ulcer preventive activities among patients

	Strongly not confident	Moderately not confident	Confident	Moderately confident	Strongly confident
	f (%)	*f* (%)	*f* (%)	*f* (%)	*f* (%)
I can protect my feet	66 (55%)	0 (0%)	11 (9.2%)	32 (26.7%)	11 (9.2%)
I can examine my feet every day to check for cuts, scratches, blisters, redness, or dryness even if I'm not in pain or uncomfortable.	66 (55%)	0 (0%)	11 (9.2%)	32 (26.7%)	11 (9.2%)
I can determine when to use a pumice stone to smooth corns and/or calluses on my feet. I can dry between my toes after washing my feet. I can determine when my toenails need to be clipped by a podiatrist.	66 (55%)	0 (0%)	11 (9.2%)	32 (26.7%)	11 (9.2%)
Prior to dipping my feet into the water, I may check the water's temperature.	66 (55%)	0 (0%)	11 (9.2%)	32 (26.7%)	11 (9.2%)
Even when I'm not in pain or uncomfortable, I may examine my feet daily to look for cuts, scratches, blisters, redness, or dryness.	66 (55%)	0 (0%)	11 (9.2%)	32 (26.7%)	11 (9.2%)
I am able to judge when to use a pumice stone on my foot to remove calluses and/or corns. After washing my feet, I can pat dry between my toes. I am able to tell when a podiatrist is necessary to trim my toenails.	66 (55%)	0 (0%)	0 (0%)	43 (35.8%)	11 (9.2%)
I could take a look at the water's temperature before putting my feet in it.	66 (55%)	0 (0%)	0 (0%)	44 (36.7%)	10 (8.3%)
If I was told to do so, I can wear shoes and socks every time I walk (includes walking indoors)	66 (55%)	0 (0%)	10 (8.3%)	44 (36.7%)	0 (0%)
When I go shopping for new shoes, I can choose shoes that are good for my feet	66 (55%)	0 (0%)	10 (8.3%)	44 (36.7%)	0 (0.0%)
I can call my doctor about problems with my feet	66 (55%)	0 (0%)	0 (0%)	44 (36.7%)	10 (8.3%)
I can check the insides of my shoes for problems that can harm my feet before putting them on	55 (45.8%)	11 (9.2%)	11 (9.2%)	33 (27.5%)	10 (8.3%)
I can routinely apply lotion on my feet if directed to do so	55 (45.8%)	11 (9.2%)	11 (9.2%)	22 (18.3%)	21 (17.5%)

Table 5: *Measure of confidence (Self-efficacy), N=120*

As shown in Table 5, 66 (55.0%), 0 (0.0%), 11 (9.2%), 32 (26.7%) and 11 (9.2%) of the participants responded that, they were strongly not confident, moderately not confident, confident, moderately

confident and strongly confident respectively to each of items ‘I can protect my feet’, ‘even without pain/discomfort, I can look at my feet daily to check for cuts, scratches, blisters, redness or dryness’, ‘After washing my feet, I can dry between my toes’, ‘I can judge when my toenails need to be trimmed by a podiatrist’, ‘I can trim my toenails straight across’, and ‘I can figure out when to use a pumice stone to smooth corns and/or calluses on my feet’. Majority of the participants agreed they were strongly not confident, moderately not confident, confident, moderately confident and strongly confident respectively to item which stated, "I can test the water's temperature before putting my feet into it". Overall, the mean self-efficacy score was 28.47±18.19.

Behavior Item	Response Options	*f* (%)
Examination & Hygiene		
How often do you examine your feet?	Once a week	11 (9.2)
	2–6 times a week	55 (45.8)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Do you check your shoes before you put them on?	Once a week	11 (9.2)
	2–6 times a week	55 (45.8)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Do you check your shoes when you take them off?	Once a week	33 (27.5)
	2–6 times a week	33 (27.5)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Do you wash your feet?	Once a week	33 (27.5)
	2–6 times a week	33 (27.5)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Do you check feet are dry after washing?	Once a week	33 (27.5)
	2–6 times a week	33 (27.5)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Do you dry between toes?	Once a week	33 (27.5)
	2–6 times a week	33 (27.5)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Do you use moisturizing cream on your feet?	Once a week	33 (27.5)
	2–6 times a week	33 (27.5)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Do you apply cream between toes?	Once a week	33 (27.5)
	2–6 times a week	33 (27.5)
	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Are your toenails cut?	Once a week	33 (27.5)
	2–6 times a week	33 (27.5)

	Once a day	21 (17.5)
	More than once a day	33 (27.5)
Footwear Habits		
Do you wear unfastened slippers?	Most of the time	33 (27.5)
	Sometimes	33 (27.5)
	Rarely	10 (8.3)
	Never	44 (36.7)
Do you wear sneakers?	Most of the time	33 (27.5)
	Sometimes	33 (27.5)
	Rarely	10 (8.3)
	Never	44 (36.7)
Do you wear shoes with straps, Velcro, or lace-up closures?	Most of the time	33 (27.5)
	Sometimes	33 (27.5)
	Rarely	21 (17.5)
	Never	33 (27.5)
Do you wear shoes with pointy toes?	Most of the time	33 (27.5)
	Sometimes	33 (27.5)
	Rarely	21 (17.5)
	Never	33 (27.5)
Do you dress in mules or flip-flops?	Most of the time	33 (27.5)
	Sometimes	33 (27.5)
	Rarely	21 (17.5)
	Never	33 (27.5)
Is it customary to break in new shoes gradually?	Always	22 (18.3)
	Most of the time	44 (36.7)
	Sometimes	21 (17.5)
	Rarely/Never	33 (27.5)
Do you wear synthetic socks (e.g., nylon)?	Most of the time	22 (18.3)
	Sometimes	44 (36.7)
	Rarely	21 (17.5)
	Never	33 (27.5)
Do you wear shoes without socks/tights?	Never	22 (18.3)
	Rarely	44 (36.7)
	Sometimes	21 (17.5)
	Often	33 (27.5)
How often do you replace socks/tights?	< 4 times/week	33 (30.3)
	4–6 times/week	21 (19.3)
	Daily	33 (30.3)
	> once/day	22 (20.2)
Barefoot Practices & First Aid		
Do you go barefoot at home?	Often	11 (9.2)
	Sometimes	55 (45.8)
	Rarely	21 (17.5)
	Never	33 (27.5)
Are you barefoot outside?	Often	22 (18.3)
	Sometimes	44 (36.7)
	Rarely	32 (26.7)
	Never	22 (18.3)
Do you use a hot water bottle in bed?	Often	22 (18.3)
	Sometimes	44 (36.7)
	Rarely	32 (26.7)
	Never	22 (18.3)
For corns, do you use home treatments (e.g., plasters)?	Never	22 (18.3)
	Rarely	44 (36.7)
	Sometimes	21 (17.5)
	Often	33 (27.5)
For blisters, do you use a dry dressing?	Never	22 (18.3)

	Rarely	44 (36.7)
	Sometimes	10 (8.3)
	Often	44 (36.7)
For cuts/grazes/burns, do you use a dry dressing?	Never	22 (18.3)
	Rarely	44 (36.7)
	Sometimes	21 (17.5)
	Often	33 (27.5)

Table 6. *Respondents' foot self-care behavior/activities, N=120.*

As shown in Table 6, 11 (9.2%), 55 (45.8%), 21 (17.5%) and 33 (27.5%) consented that, they examined their feet and check their shoes before they put them on once a week, 2 – 6 times a week, once a day and more than once a day respectively. Also, 33 (27.5%), 33 (27.5%), 21 (17.5%) and 33 (27.5%) responded once a week, 2 – 6 times a week, once a day and more than once a day respectively to each of items; "Do you wash your feet?" "Do you check that your feet are dry after washing?" "Do you dry between your toes?" "Do you use moisturizing cream on your feet?" "Do you use moisturizing cream between your toes?" and "Are your toenails cut?" - for each item, 33 (27.5%), 33 (27.5%), 10 (8.3%), and 44 (36.7%) of the participants gave their response most of the time, occasionally, seldom, and never, respectively. For questions on "Do you wear trainers?" and "Do you wear slippers without fastenings?" - 33 (27.5%), 21 (17.5%), 33 (27.5%), and 33 (27.5%) of the participants answered each item most of the time, seldom, infrequently, and never, respectively.

For the question, 'Do you break in new shoes gradually?', 22 (18.3%), 44 (36.7), 21 (17.5%) and 33 (27.5%) of the subjects responded always, most of the time, sometimes and rarely/never respectively. Similarly, 22 (18.3%), 44 (36.7), 21 (17.5%) and 33 (27.5%) responded most of the time, sometimes, rarely and never respectively to "Do you wear artificial fiber (e.g., nylon) socks. The response pattern was also 22 (18.3%), 44 (36.7), 21 (17.5%) and 33 (27.5%) implying never, rarely, sometimes and often respectively for question 'Do you wear shoes without socks/stockings/tights?' 'Do you change your socks/stockings/tights?' got the response pattern, 22 (20.2%), 33 (30.3%), 21 (19.3%) and 33 (30.3%) implying more than once a day, daily, 4-6 times a

week and less than 4 times a week respectively for a total of 109 responses for the item.

Items ‘Do you walk around the house in bare feet?’ and ‘Do you walk outside in bare feet?’ turned in the response pattern, 11 (9.2%), 55 (45.8), 21 (17.5%) and 33 (27.5%) to denote often, sometime, rarely and never respectively. Also, 22 (18.3%), 44 (36.7%), 32 (26.7%) and 22 (18.3%) gave the responses, often, sometime, rarely and never respectively to item "Do you use a hot water bottle in bed?", item "Do you place your feet close to the flames?" and "Do you place your feet on a radiator?". For item ‘Do you use corn remedies/ corn plasters/paints when you get a corn?’ and item ‘Do you put a dry dressing on a graze, cut or burn when you get one?’, 22 (18.3%), 44 (36.7%), 21 (17.5%) and 33 (27.5%) of the participants responded, never, rarely, sometimes and often respectively to each of the items. On the other hand, the responses to the question, "Do you put a dry dressing on a blister when you get one?" were as follows: 22 (18.3%), 44 (36.7%), 10 (8.3%), and 44 (36.7%). Whereas the mean of 39.34±27.57 was obtained for respondents’ foot self-care behavior.

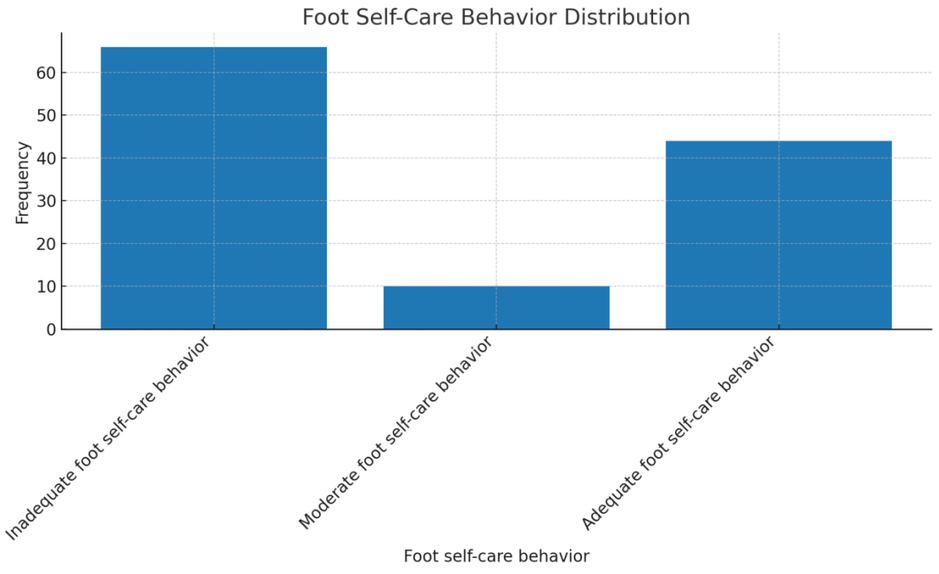

Figure 2. *Respondents’ foot self-care behavior*

As shown in Figure 2, 66(55%) of them had inadequate foot self-care behavior, only 10 (8.3%) of them had moderate foot self-care behavior, while 44 (36.7%) of the respondents had adequate foot self-care behavior.

Hypotheses testing

Ho: There is no significant individual and composite association between age, gender, educational status and behavior of FSC among PWDM.

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig. (p-value)
(Constant)	38.543	7.692		5.011	<0.0001
Age	2.622	6.077	0.133	0.432	0.667
Gender	-1.078	9.246	-0.018	-0.117	0.907
Educational Status	-2.089	8.227	-0.086	-0.254	0.800

Note: Dependent Variable = FSC Behavior

Table 7. *Multivariate analysis between age, gender, educational status and foot self-care behavior among* PWDM

As shown in Table 7, multiple regression analysis was conducted to predict the association between age, gender and educational status and self-care behavior. Particularly, by ANOVA summary for the Regression Model, the resultant model was not significant, F (3, 119) = 0.97, p = 0.962, R^2 = 0.002. Table 7 revealed that the individual variables also had no significant association of age (t = 0.432, p = 0.667), gender (t = -0.117, p = 0.907) and educational status (t = -0.254, p = 0.800) with FSC behavior.

As shown in Table 8, multiple regression analysis was conducted to test the association between knowledge of FSC, efficacy and self-care behavior of people with diabetes. Particularly, by ANOVA summary for the Regression Model, the resultant model for foot self-care efficacy and FSC knowledge against self-care behavior was significant, F (2, 119) = 589.764, p<0.0001, R^2 = 0.910.

Table 8 revealed that individual variables had significant association FSC knowledge (t =8.252, p<0.0001) and FSC efficacy (t =3.610, p<0.0001) with FSC behavior.

Predictor	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig. (p-value)
(Constant)	-31.312	3.983	–	-7.861	<0.0001
Foot Self-Care Knowledge	6.023	0.730	0.672	8.252	<0.0001
Foot Self-Care Efficacy	0.446	0.123	0.294	3.610	<0.0001

Note: Dependent Variable = Foot Self-Care Behavior.

Table 8. *Multivariate analysis between Foot Self-Care Knowledge, Foot Self-Care Efficacy and Foot Self-Care Behavior among PWDM*

DISCUSSION

The current investigation discovered that very few participants were older than 70. This result contradicts the age-based rate reported by Odusan, Amoran, and Salami [25], who observed that the elderly have a higher prevalence of diabetes than youngsters. Nonetheless, the present result is consistent with the CDC's [26] assertion that the number of children, adolescents, and young adults developing DM is rising. The fact that many young people are leading improper lifestyles could help to explain this predicament. Some of these youths, who come from parents who are secure in terms of socioeconomic status yet reside in the city, lead unhealthy lives because they eat junk food and exercise infrequently. This scenario can make a good number of them to be diabetic. The study's finding in concordance with previous research findings shows more females with diabetes, this agrees with Turan et al. [27] and Wazqar et al. [5] that more females are diagnosed with diabetes more than their male counterparts. Most of the respondents had higher education this is in agreement with Bekele [28] findings that higher educational status is one of the predictors of FSC practices. Majority were T2DM (53.8%) which corresponds with Sen et al. [29] and Wanja et al. [30], of which majority were diagnosed within the last 24 months.

NSC Nursing 2026, Volume 1, Nr. 1 pp 1-31

The level of knowledge of PWDM on foot ulcer preventive self-care activities.

One of the main conclusions of this study was that the respondents' level of FSC knowledge was low. Consequently, there is a need for skilled instruction on diabetes FSC and the creation of guidelines for PWDM to carry out FSC. This conclusion runs counter to prior research by Alshammari et al. [31], who discovered that around 282 (76.6%) of the patients in their Riyadh, Saudi Arabia, study had a thorough awareness of foot ulcers and diabetic foot. The literature, however, provides a wealth of evidence to support the reported position of low knowledge of FSC. Goie and Naidoo [12] and Adeyemi et al. [16] for example, agreed with Ogunlana [29] when she stated that individuals with diabetes mellitus in Sub-Saharan Africa have a limited understanding of the complications associated with their disease. As Africans, we rely heavily on the rule of thumb in many situations, particularly in times of emergency when managing diabetes calls for it. Except for the standard, frequently ineffectual recommendations obtained during hospital visits, there are very few proactive steps available for managing the difficulties associated with diabetes in such circumstances. Thus, the creation of an out-of-hospital care regimen becomes necessary.

The self-efficacy of PWDM to practice foot ulcer preventive activities

The discovery that the majority of those who participated had poor FSC Efficacy scores is another indication of the growing mortality and morbidity linked to diabetes and its complications. People lack the abilities, bravery, and self-assurance necessary to combat, control, and overcome DFU, a serious symptom that causes suffering and casualties for diabetics. The findings in this study deviated from the seemingly typical trend, even though Narmawan, Syahrul, and Erika [32] and Sharoni et al. [33] had previously demonstrated that the patients in their studies had high FSC efficacy. Additional published research that supports the inherent deficiencies in FSC efficacy or parallel variables among diabetics include Wazqar et al. [5], Khan et al. [9], Mekonen and Demssie [34], and Turan et al. [27]. These studies were founded on evidentiary viewpoints. It is interesting to

know why the present result in this study—which isn't generally praised in the literature—is what it is. However, the majority's low FSC efficacy is not surprising in the slightest because, despite claims to the contrary, a population lacking in knowledge cannot assert that it has high self-efficacy—a concept that is far higher than knowledge and that no conventional education can ensure. In summary, while knowing is crucial for self-care, it might not necessarily translate into self-efficacy. This suggests that educational initiatives that just emphasize knowledge may not result in self-efficacy, and it is unwarranted to assume that a lack of knowledge will lead to a lack of efficacy or self-confidence. This means that, if self-efficacy had been high, the participants in this study would have had low moment foot self-care knowledge.

Foot self-care behavior of people with diabetes

A significant finding of this study indicated that a considerable number of individuals had insufficient foot self-care practices. This leads to the primary rationale of this study. Low levels of self-care behavior are thought to be the underlying cause of DFU. The present finding of low self-care behavior with respect to DFU emphasizes the earlier position of Ammar et al. [35] that foot ulcers and amputations are regrettably prevalent with poverty, improper sanitation and hygiene, and barefoot walking often connecting to worsen the adverse effects of diabetic foot damage. Hirpha, Tatiparthi, and Mulugeta's [13] additional research, which observed that those with diabetes did not sufficiently self-inspect, wash their feet at least once a day, dry after washing, and moisturize the dry skin as they walked barefoot, in sandals or slippers, or in shoes without socks, supports the results under discussion. It is important to stress that the existing practice goes against the advice given by Armstrong et al. [36] and van Netten et al. [37], who provided factual evidence to support their recommendations regarding the importance of routine foot inspections for PWDM. The problem persists when the number of patients in need of health care services is not matched by the number of caregivers and health workers/educators currently in place. This documented anomaly is

NSC Nursing 2026, Volume 1, Nr. 1 pp 1-31

therefore not unrelated to the culture of unsanitary living, complacency, misinformation, and poor knowledge among some people.

The results demonstrated that foot self-care behavior was not predicted by age, gender, or educational attainment. While earlier research [33,32,20,38] suggested that specific age, gender, and educational level reinforce FSC behavior, the present investigation has documented the opposite for reasons that are closely related to the fact that care behavior is a personal matter, independent of known biases or socioeconomic inclinations.

The findings also highlight the importance of collaboration in attempts to instill the necessary skills and attitude to give the motivation needed for effective self-care behavior. Lastly, the significant individual and joint association of FSC knowledge and foot care self-efficacy with FSC behavior highlights the need for each of these factors to instill self-care behavior. In their research, Wendling and Beadle [39] showed that self-efficacy advancement is a successful nursing intervention for health promotion. Positive outcomes, such as better outcomes for people with diabetes mellitus, fewer admissions, and fewer ER visits, have been linked to this. Additionally, the study offered some limited understanding of the significance of the identified relationships. Support for the necessity of matching knowledge to practical skill training was given in 2016 by Sarkar et al. and Sharoni et al. [33], whose studies, respectively, demonstrated a major beneficial connection between self-efficacy and self-care practices among PWDM and an improvement in FSC behavior, foot care knowledge, foot care outcome expectation, and QoL (physical symptoms) after training.

CONCLUSION

Patients with diabetic foot ulcers (DM) frequently get DFU, and foot self-care (FSC) is a useful strategy to reduce this risk. But self-care is becoming more and more common because paid care services are expensive and there aren't many caregivers accessible. With an emphasis on young individuals aged 21 to 30, the research sought to assess FSC behavior for DM patients. Participants

in the study had poor scores on behavior, efficacy, and knowledge assessments. Age, gender, and educational attainment did not significantly correlate with foot self-care behavior.

It is necessary to invest in educational interventions to provide patients with the skills and knowledge necessary for good foot care practices. These initiatives shouldn't, however, necessarily be classified according to factors like age, gender, or educational attainment. The results demonstrated a substantial correlation between efficacy and foot self-care behavior, indicating that increasing efficacy or FSC knowledge on its own might greatly enhance self-care behavior.

According to the study's findings, 91.1% of the variance in foot self-care behavior could be explained by knowledge of FSC and efficacy, which had a substantial composite connection with foot self-care behavior. In order to expedite the practice of foot self-care, educators must impart information of foot self-care (FSC) and its efficacy in addition to the requisite technology, scientific skills, practices, and artistic qualities. For greatest benefit, this will assist DM patients in initiating, managing, and engaging in self-care practices.

Based on the findings and discussions presented in this study, several important recommendations are proposed. Healthcare providers should prioritize expanding and promoting diabetes education programs that not only enhance patients' knowledge of foot self-care (FSC) but also strengthen self-efficacy by teaching practical skills and fostering confidence in patients' ability to carry out these activities. Patients must also be educated on the importance of choosing appropriate footwear, with a strong emphasis on the benefits of well-fitting shoes and the risks of walking barefoot, both indoors and outdoors, as a preventive measure against foot complications. In addition to education, healthcare professionals and educators are encouraged to implement strategies that boost patients' self-efficacy, such as goal-setting, individualized feedback, and supportive reinforcement that affirms their ability to manage self-care effectively.

Developing and distributing clear, concise self-care guidelines or protocols is essential, as is stressing the importance of regular foot examinations. Patients should be empowered to conduct

daily foot checks and trained to identify signs such as cuts, blisters, or dryness that may require prompt attention. Furthermore, they should be cautioned against risky practices like using razor blades to remove corns and calluses and instead be encouraged to seek professional care for such concerns. Another important hygiene recommendation is to emphasize the necessity of changing socks regularly to maintain healthy foot conditions and prevent infections. These educational efforts should be institutionalized within healthcare policies at both national and facility levels, and embedded into healthcare training curricula for sustainable impact. Additional studies should be carried out to assess the effectiveness of foot care education, identify barriers to its implementation, and develop strategies to address these challenges.

Limitations and recommendations

The generalizability of the findings may be limited by factors such as sample size and study design, and future research should consider broadening the scope and incorporating multiple methodological approaches to enrich the validity of results. This study contributes to knowledge by showing that while knowledge is important, it alone is insufficient to improve patients' foot self-care behavior unless it is reinforced by self-efficacy strategies and potentially other factors not examined in this research. It also presents evidence that differentiated learning based on age, gender, or education level may not be necessary for effective foot self-care training among patients. A key outcome of this study is the proposed knowledge-efficacy-behavior framework, which provides a conceptual basis for mastering diabetic foot self-care behavior.

In light of the study's limitations and findings, further investigations are encouraged. Future researchers may consider integrating more independent variables—such as personal hygiene habits, coexisting health conditions, and access to healthcare services or information—into predictive models for foot self-care behavior. A quasi-experimental study design may also be employed to evaluate the effectiveness of targeted intervention packages on patients' behavior. Additionally, new

tools such as systematic observation instruments can be developed to complement the questionnaire method used in this study, offering a more comprehensive assessment of self-care practices.

Local Ethics Committee approval:

1. The study protocol was approved by the Research and Ethics Committee of Ogun State Hospital Management Board with REF NO: SHA 52/VOL XII/116. Date of approval: August 23, 2023.

2. The study protocol was approved by the Research and Ethics Committee of Federal Medical Center with REF NO: FMCA/470/HREC/01/2023/23NHREC/08/10-2015. Date of approval: June 19, 2023

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Authors' contribution

Oseni Rukayat: Conceptualized idea and conducted full research.

Emmanson Emmanson: Assisted with the research and manuscript preparation for publication

Kolawole Ifeoluwapo: Assisted with the design of questionnaire and conducting interviews with the selected nurses.

Adejumo Prisca: Was responsible for literature reviews.

Obilor Helen: performed data analysis and edited the manuscript for publication.

NSC Nursing 2026, Volume 1, Nr. 1 pp 1-31

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SELF-CARE KNOWLEDGE, BEHAVIORAL PRACTICES, AND PREVENTIVE STRATEGIES FOR DIABETIC FOOT ULCERS AMONG INDIVIDUALS WITH DIABETES IN TERTIARY HOSPITALS IN NIGERIA: A CROSS-SECTIONAL STUDY

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The Impact of Nurse Manager Leadership Styles on Nurse Job Satisfaction: A Cross-Sectional Study at Hamad Medical Corporation, Qatar

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ABSTRACT

Introduction: Job satisfaction is a key determinant of nurse retention, morale, and quality of care. Leadership styles directly shape satisfaction by influencing recognition, autonomy, and support within clinical environments. In Qatar's multicultural nursing workforce, understanding these dynamics is critical.

Objective: This study investigated the relationship between nurse manager leadership styles and nurses' job satisfaction at Hamad Medical Corporation (HMC).

Method: A cross-sectional survey was conducted with 980 registered nurses recruited through simple random sampling. Data were collected using a structured online questionnaire incorporating socio-demographic data, the Multifactor Leadership Questionnaire (MLQ-5X), and the Minnesota Satisfaction Questionnaire – Short Form (MSQ). Descriptive and inferential statistics, including Spearman's correlation, Mann–Whitney U, and Kruskal–Wallis H tests, were employed.

Results: The sample was predominantly female (72.1%) and expatriate, with Indian (42.1%) and Filipino (33.9%) nurses forming the largest groups. Transactional leadership (mean = 2.57) was more common than transformational leadership (mean = 2.20). Overall satisfaction levels were moderate. Transformational leadership showed a strong positive correlation with both intrinsic satisfaction (rho = 0.66, $p < 0.001$) and extrinsic satisfaction (rho = 0.79, $p < 0.001$), yielding an overall significant relationship with total job satisfaction (rho = 0.73, $p < 0.001$).Transactional leadership demonstrated a weak to moderate positive correlation (rho = 0.30, $p < 0.001$), while passive-avoidant leadership showed no meaningful association with satisfaction (rho = 0.06, $p = 0.041$).

Conclusion: Transformational leadership has the strongest influence on job satisfaction, while transactional and passive-avoidant styles limit long-term fulfillment. Enhancing transformational leadership at HMC may improve satisfaction, retention, and workforce stability.

Keywords: Leadership, Nurses, Job Satisfaction, Retention

NSC Nursing 2026, Volume 1, Nr. 2 pp 32-58

INTRODUCTION

In the dynamic and demanding field of healthcare, nurses occupy a vital role. They are not merely caregivers but the backbone of healthcare institutions, providing essential treatment, compassion, and expertise to patients in need. The satisfaction of nurses is a crucial element that directly impacts their well-being, retention, and ultimately the quality of care delivered to patients.

Leadership plays a central role in shaping the experiences of nurses within healthcare organizations. Nurse managers, through their leadership styles, have the ability to empower their teams, foster a supportive work culture, and contribute to overall job satisfaction. Effective leadership can inspire motivation, strengthen commitment, and enhance the professional fulfillment of nurses. Conversely, ineffective or unsupportive leadership can create dissatisfaction, burnout, and even intentions to leave the profession, posing challenges for healthcare quality and staff retention[1,2].

Avolio and Bass have identified three primary leadership styles: transformational, transactional, and passive-avoidant (laissez-faire). Transformational leaders inspire and motivate followers toward shared goals, encouraging innovation and personal growth. Transactional leaders emphasize structure, rewards, and performance management. Passive-avoidant leaders, however, tend to disengage, avoiding intervention and decision-making, often resulting in reduced productivity and workplace dissatisfaction[3,4]. Nurse managers often apply one or a combination of these styles, with varying outcomes on nurse satisfaction.

Studies conducted in Qatar and the surrounding region highlight the prevalence and influence of leadership styles in healthcare. For example, transformational leadership has been shown to be the most commonly practiced style among nursing leaders in Qatar[5]. Additionally, research in Saudi Arabia and Bahrain has demonstrated that transformational and transactional leadership approaches are positively linked to nurses' satisfaction, commitment, and reduced turnover intentions[6,7]. These findings reinforce the importance of leadership style as a determinant of nurse satisfaction in Middle Eastern healthcare settings, including at HMC.

The relevance of this issue at HMC is further underscored by local research showing that a significant proportion of nurses and healthcare workers have reported dissatisfaction, stress, and turnover intentions, particularly during and after the COVID-19 pandemic[8]. Such challenges highlight the pressing need to evaluate how leadership styles adopted by nurse managers influence nurses' satisfaction within HMC.

Therefore, this study seeks to explore the perceptions of nurses regarding their managers' leadership styles and to examine the relationship between these leadership approaches and nurses' job satisfaction. Understanding this relationship is crucial to developing effective leadership strategies that enhance nurse satisfaction, reduce turnover, and improve the overall quality of patient care. Addressing this gap is essential to achieving Qatar's National Health Strategy goals for workforce sustainability and excellence in healthcare delivery.

Objectives

This study aimed to describe nurses' perceptions of their managers' leadership styles, assess their job satisfaction levels, and examine associations between leadership approaches and satisfaction dimensions.

MATERIALS AND METHODS

Type and Classification of Study

This study employed a quantitative, cross-sectional research design to examine the relationship between nurse manager leadership styles and nurses' job satisfaction at HMC, Qatar.

Comparisons and Predictors of Interest

The primary focus was on comparing various nurse manager leadership styles and their respective impacts on staff nurses' job satisfaction.

Study Duration

The study was conducted over a period of approximately four months, from November 5, 2024, to March 1, 2025**.**

Sample Size Justification

To ensure reliability and representativeness of the findings, a sample size calculation was conducted based on a population of approximately 12,000 nurses. Using a 95% confidence level and a ±3% margin of error, an estimate minimal sample size of 1067 nurses was determined to be appropriate. The sample size was calculated using Cochran's formula:

$$n = \frac{Z^2 p(1-p)}{e^2},$$

where Z = 1.96, $p = 0.5$, $e = 0.03$. Since the estimate minimal sample size is large and >5% compared to the population from which it is obtained (12,000), the sample size can be reduced to 980 nurses. The value p = 0.5 was chosen to provide the most conservative estimate and ensure adequate sample size in the absence of prior data, while a ±3% margin of error was selected to achieve high precision and reliable representativeness of the study findings.

Study Population and Setting

The study population comprised registered nurses working in various departments across Hamad Medical Corporation (HMC), Qatar. Participants were selected through a simple random sampling method. The sampling frame included the complete list of licensed nurses at HMC, each assigned a unique identification number. Using Microsoft Excel's RAND function, the list was randomly ordered to facilitate unbiased selection.

To account for an anticipated non-response rate, the initial calculated sample of 980 nurses determined based on a 95% confidence level and a ±3% margin of error for a population of approximately 12,000 nurses was increased by 245, resulting in a total of 1,225 nurses being invited

to participate. Questionnaires were distributed via official HMC email accounts, and 980 completed responses were obtained, forming the final study sample. This strategy ensured a representative sample across different hospitals and nursing units within HMC.

The study was carried out exclusively within HMC facilities.

Inclusion Criteria

- Registered nurses currently employed at HMC.
- Nurses who voluntarily consented to participate.
- Nurses with a minimum of six months of experience at HMC to ensure familiarity with the organizational culture and leadership practices.

Exclusion Criteria

- Nurses on leave or absent during data collection.
- Nurses in managerial or supervisory roles.
- Contract or temporary nurses.

Data Collection

Data were collected via structured online questionnaires distributed through Google Forms. The survey instruments covered the following areas:

1. *Socio-demographic Data*

   Collected information included age, gender, nationality, years of nursing experience, tenure at HMC, education level, hospital, and department. Age was categorized into three groups (≤30 years, 31–45 years, and >45 years) to reflect early, mid-, and late-career stages. Similarly, years of nursing experience and years of experience within HMC were grouped as ≤5 years, 6–15 years,

and >15 years to allow meaningful comparisons between groups and ensure adequate sample sizes for statistical analysis.

2. *Multifactor Leadership Questionnaire (MLQ-5X)*

   This 45-item tool assessed leadership styles (transformational, transactional, and laissez-faire) across dimensions such as inspirational motivation, intellectual stimulation, and contingent reward. Responses were recorded on a 5-point Likert scale (0 = "Not at all" to 4 = "Frequently, if not always") [9]. Items were grouped into their respective leadership dimensions using the MLQ scoring key. For each dimension, a mean score was calculated by summing the responses to the items composing that scale and dividing by the number of valid responses. All leadership style subscales consisted of four items each. Blank or missing responses were excluded from the calculations. Higher mean scores indicated more frequent exhibition of the corresponding leadership behaviors. Leadership dimensions were analyzed as continuous variables rather than categorizing leaders into a single leadership style.

   The tool demonstrated strong reliability, with Cronbach's alpha ranging from 0.70 to 0.90.

3. *Minnesota Satisfaction Questionnaire (Short Form)*

   This 20-item scale measured job satisfaction across facets such as supervision, pay, promotion, coworkers, and communication. Responses ranged from 1 ("Not Satisfied") to 5 ("Extremely Satisfied")[10]. The instrument showed good internal consistency, with a Cronbach's alpha range of 0.70 to 0.90.

Primary and Secondary Outcomes

- Primary Outcomes: Nurses' job satisfaction.
- Secondary Outcome: The relationship between nurse manager leadership styles and the three primary outcomes.

Statistical analysis

Descriptive statistics were used to summarize participant characteristics and key variables such as means, standard deviations, medians, ranges, and percentages. Normality of continuous variables was assessed using the Shapiro–Wilk test, which indicated non-normal distribution ($p < 0.05$). Therefore, non-parametric statistical tests were applied, including Mann–Whitney U and Kruskal–Wallis H for group comparisons.

Correlation between leadership styles and job satisfaction was analyzed using Spearman's rank correlation coefficient (ρ) due to non-normal distribution. The statistical tests with p-value < 0.05 were considered significant. All analyses were performed using SPSS-26 software**.**

Ethical Approval and Informed Consent Statement

Informed consent was obtained from all study participants. The purpose, procedures, and voluntary nature of the study were explained through official internal communication channels via HMC e-mail. Participants provided electronic consent after having at least two months to review the study information before deciding to participate. Only registered nurses employed at HMC who met the inclusion criteria were enrolled. No financial incentives were offered for participation.

The study was approved by the Medical Research Center (MRC) – Local Ethics Committee of Hamad Medical Corporation, Qatar (Protocol No. MRC-01-24-356), with approval granted on 15/08/2024, and was conducted in accordance with the principles of the Declaration of Helsinki and Good Clinical Practice (GCP), as well as the regulations of the Ministry of Public Health (MoPH), Qatar. Participant anonymity and data confidentiality were strictly maintained throughout the study.

RESULTS

Demographic and Professional Characteristics

The study sample of 980 nurses demonstrated a pronounced gender imbalance, with females

constituting nearly three-quarters of the workforce (Table 1). Marriage was the predominant status, and Indian and Filipino nationals together comprised more than three-quarters of the participants, highlighting the concentration of the workforce among specific nationalities. Age distribution indicated that the majority of nurses were mid-career professionals aged 30–45 years (67.04%), whereas younger nurses (≤30 years) formed a small minority (6.53%).

Characteristics	Categories	Frequency (n)	Percent (%)	Mean± SD
Gender	Male	273	27.86	
	Female	707	72.14	
Marital Status	Single	138	14.08	
	Married	820	83.67	
	Widowed	8	0.82	
	Separated / Divorced	14	1.43	
Nationality	Cuban	36	3.67	
	Egyptian	16	1.63	
	Filipino	332	33.88	
	Indian	413	42.14	
	Iranian	3	0.31	
	Jordanian	64	6.53	
	Lebanese	5	0.51	
	Palestinian	8	0.82	
	Somali	3	0.31	
	Sudanese	51	5.20	
	Tunisian	49	5.00	
Age (years)	≤30 years	64	6.53	40.40 ± 7.89
	]30-45]	657	67.04	
	> 45	259	26.43	

Table 1. *Demographic Characteristics (N=980)*

Professional experience revealed that the sample possessed substantial nursing tenure, with an average of 16.85 ± 7.14 years (Table 2). While more than half had 5–15 years of overall experience, a significant proportion (43.57%) exceeded 15 years. Organizational experience within HMC averaged 9.93 ± 7.54 years, indicating a mix of long-standing and relatively newer staff. Educational attainment leaned heavily toward Bachelor's degrees (76.63%), with smaller proportions holding diplomas (14.18%) or Master's degrees and higher (9.18%).

Hospital and departmental distribution demonstrated a concentration of staff in a limited number of facilities and clinical areas. Hamad General Hospital employed the largest share (27.55%), followed by Rumailah (11.63%), Al Wakra (11.43%), and the Women's Wellness & Research Center (8.16%). The Surgical and Medical departments collectively accounted for more than 65% of participants, whereas Critical Care, Emergency, and Outpatient/ Ambulatory units had smaller staff representation. These demographic patterns suggest that the HMC nursing workforce is highly experienced and predominantly composed of expatriate professionals, highlighting the importance of culturally adaptive leadership strategies.

Characteristics	Categories	Frequency (n)	Percent (%)	Mean± SD
Years of experience as a nurse	≤5 years	21	2.14	16.85 ± 7.14
	]5-15]	532	54.29	
	> 15	427	43.57	
Years of experience in HMC	≤5 years	360	36.73	9.93 ± 7.54
	]5-15]	369	37.65	
	> 15	251	25.61	
Educational background	Diploma	139	14.18	
	Bachelor's degree	751	76.63	
	Master's degree	90	9.18	
Hospital	Hamad General Hospital	270	27.55	
	Ambulatory Care Center	58	5.92	
	Qatar Rehabilitation Institute	17	1.73	
	NCCCR	19	1.94	
	Mental Health Service	48	4.90	
	Communicable Disease Center	15	1.53	
	Al Khor Hospital	72	7.35	
	Rumailah Hospital	114	11.63	
	Al Wakra Hospital	112	11.43	
	Hazm Mebaireek General Hospital	64	6.53	
	Aisha Bint Hamad Al Attiyah Hospital	63	6.43	
	The Cuban Hospital	17	1.73	
	Women's Wellness and Research Center	80	8.16	
	Heart Hospital	31	3.16	
Department	Critical Care / Emergency Services	220	22.45	
	Medical Department	296	30.20	
	Surgical Department	348	35.51	
	Outpatient (OPD) and Ambulatory Services	116	11.84	

Table 2. *Professional Characteristics (N=980)*

NSC Nursing 2026, Volume 1, Nr. 2 pp 32-58

Nurse Manager Leadership Styles

The analysis of nurse manager leadership styles revealed that transactional leadership was more prominent (mean = 2.57, SD = 0.85; Q1 = 2.00, Q3 = 3.12) compared to transformational leadership (mean = 2.20, SD = 1.05; Q1 = 1.55, Q3 = 3.00). This suggests that managers primarily use structured management approaches, emphasizing performance-based rewards and active monitoring (Table 3).

	Minimum	Maximum	Mean	S D	Median	Q1	Q3
Idealized Attributes or Idealized Influence (Attributes)	0.00	4.00	2.19	1.14	2.25	1.50	3.00
Idealized Behaviors or Idealized Influence (Behaviors)	0.00	4.00	2.35	1.15	2.50	1.75	3.25
Inspirational Motivation	0.00	4.00	2.34	1.22	2.50	1.50	3.25
Intellectual Stimulation	0.00	4.00	2.21	1.11	2.25	1.50	3.00
Individual Consideration	0.00	4.00	1.94	0.96	2.00	1.25	2.75
Transformational	**0.00**	**4.00**	**2.20**	**1.05**	**2.35**	**1.55**	**3.00**
Contingent Reward	0.00	4.00	2.56	1.05	2.75	2.00	3.25
Mgmt by Exception (Active)	0.00	4.00	2.58	0.98	2.75	2.00	3.25
Transactional	**0.25**	**4.00**	**2.57**	**0.85**	**2.62**	**2.00**	**3.12**
Mgmt by Exception (Passive)	0.00	4.00	1.55	1.01	1.25	0.75	2.25
Laissez-Faire	0.00	4.00	1.43	1.05	1.25	0.50	2.25
Passive Avoidant	**0.00**	**4.00**	**1.49**	**0.97**	**1.37**	**0.75**	**2.12**
Extra Effort	0.00	4.00	2.17	1.20	2.33	1.00	3.00
Effectiveness	0.00	4.00	2.25	1.22	2.50	1.00	3.00
Satisfaction	0.00	4.00	2.28	1.31	2.50	1.00	3.00
Outcomes of Leadership	**0.00**	**400**	**2.23**	**1.20**	**2.42**	**1.05**	**3.16**

Table 3. *Nurse Manager Leadership Styles.*

Within the transactional domain, contingent reward (mean = 2.56, SD = 1.05; Q1 = 2.00, Q3 = 3.25) and management by exception active (mean = 2.58, SD = 0.98; Q1 = 2.00, Q3 = 3.25) were the most utilized strategies.

Among transformational leadership subscales, idealized influence behaviors (mean = 2.35, SD = 1.15; Q1 = 1.75, Q3 = 3.25) scored highest, indicating that some leaders act as strong role models. Conversely, individual consideration (mean = 1.94, SD = 0.96; Q1 = 1.25, Q3 = 2.75) was lowest, suggesting limited mentorship or personalized support for staff.

Passive-avoidant leadership had the lowest overall scores (mean = 1.49, SD = 0.97; Q1 = 0.75, Q3 = 2.12), particularly laissez-faire leadership (mean = 1.43, SD = 1.05; Q1 = 0.50, Q3 = 2.25), showing that managers generally remain engaged and avoid ignoring decision-making responsibilities. Management by exception passive (mean = 1.55, SD = 1.01; Q1 = 0.75, Q3 = 2.25) indicated occasional reactive behaviors. Leadership outcomes were moderate, with effectiveness (mean = 2.25, SD = 1.22; Q1 = 1.00, Q3 = 3.00) and satisfaction (mean = 2.28, SD = 1.31; Q1 = 1.00, Q3 = 3.00) reflecting satisfactory performance from the staff perspective.

The dominance of transactional leadership may reflect the organizational focus on compliance and efficiency rather than on empowerment or innovation.

Nurses' Satisfaction

The results indicate that nurses experience moderate job satisfaction across both intrinsic and extrinsic dimensions as well as in the overall satisfaction measured by the Minnesota Satisfaction Questionnaire (MSQ) - Short Form. For intrinsic satisfaction, 57.55% of participants fall into the average category (Table 4), while 20.41% report low satisfaction, with a mean score of 2.93 ± 0.93 (Q1 = 2.00, Q3 = 2.00). The quartile values indicate that most respondents cluster tightly around the lower end of the moderate range, suggesting limited variability in perceived intrinsic motivators. In contrast, extrinsic satisfaction shows that 57.14% of respondents are moderately satisfied, but a slightly higher percentage (22.86%) report low satisfaction, with a mean score of 2.74 ± 1.01 (Q1 = 2.00, Q3 = 2.00). Similar to intrinsic satisfaction, the Q1 and Q3 values suggest that extrinsic satisfaction is concentrated at the lower boundary of moderate satisfaction, reinforcing the need for improvements in external factors such as pay and recognition.

Regarding overall satisfaction (MSQ), 71.84% of respondents are in the average category, 8.57% report low satisfaction, and 19.59% report high satisfaction, with a mean score of 2.87 ± 0.94 (Q1 = 2.00, Q3 = 2.00). The quartile distribution again shows that the majority of nurses fall at the lower

end of the moderate satisfaction range. The moderate satisfaction levels indicate room for improvement, particularly in extrinsic factors such as pay and recognition.

	Range	Frequency	Percent	Min	Max	Mean±SD	Median [Q1, Q3]
Intrinsic Satisfaction	Low Satisfaction	200	20.41	1.00	5.00	2.93 (0.93)	3.00 [2.41, 3.58]
	Average Satisfaction	564	57.55				
	High Satisfaction	216	22.04				
Extrinsic Satisfaction	Low Satisfaction	224	22.86	1.00	5.00	2.74 (1.01)	2.83 [2.00, 3.50]
	Average Satisfaction	560	57.14				
	High Satisfaction	196	20.00				
General Satisfaction of MSQ	Low level of satisfaction	84	8.57	1.00	5.00	2.87 (0.94)	2.95 [2.25, 3.55]
	Average level of satisfaction	704	71.84				
	High level of satisfaction	192	19.59				

Table 4. *Nurses' Satisfaction*

Comparison of Socio-demographic Characteristics and Their Association with Nurses' Satisfaction

In Table 5, female nurses reported significantly higher job satisfaction than male nurses (mean rank: 506.43 vs 449.23, p = 0.005). Single nurses showed the highest satisfaction, followed by married and widowed nurses (550.57 vs. 473.29 vs 373.50, p = 0.006). Significant differences were observed across nationalities, with Somali nurses reporting the highest satisfaction and Cuban nurses the lowest (665.17 vs 254.44, p < 0.001). No significant differences were found by age, although nurses aged ≤30 years had slightly higher satisfaction than those >45 years and those aged 30–45 years (524.38 vs 513.45 vs 478.15, p = 0.144). Similarly, years of nursing experience showed no significant differences, but nurses with ≤5 years of experience reported higher satisfaction than those with >15 years or 5–15 years (589.64 vs 494.45 vs. 483.42, p = 0.224).

Years of experience within HMC was significantly associated with satisfaction, with nurses having >15 years reporting the highest and those with 5–15 years reporting the lowest satisfaction (537.60 vs 422.53, p < 0.001).

Characteristics	Categories	Mean Rank	Statistic	p-value (Test)
Gender	Male	449.23	85239.5	0.005(MW)*
	Female	506.43		
Marital Status	Single	550.57	10.32	0.006(KW)*
	Married	473.29		
	Widowed	373.50		
Nationality	Cuban	254.44	35.18	< 0.001(KW)*
	Egyptian	375.50		
	Filipino	494.46		
	Indian	502.89		
	Iranian	604.50		
	Jordanian	543.19		
	Lebanese	598.90		
	Palestinian	515.75		
	Somali	665.17		
	Sudanese	442.23		
	Tunisian	518.79		
Age (years)	≤30 years	524.38	3.87	0.144(KW)
	]30-45]	478.15		
	> 45	513.45		
Years of experience as a nurse	≤5 years	589.64	2.99	0.224(KW)
	]5-15]	483.42		
	> 15	494.45		
Years of experience in HMC	≤5 years	527.33	34.35	< 0.001(KW)*
	]5-15]	422.53		
	> 15	537.60		
Educational background	Diploma	529.18	11.51	0.003(KW)*
	Bachelor's degree	474.27		
	Master's degree	566.21		
Hospital	Hamad General Hospital	515.00	52.14	< 0.001(KW)*
	Al Khor Hospital	378.97		
	Rumailah Hospital	503.45		
	Al Wakra Hospital	479.68		
	Hazm Mebaireek General Hospital	505.44		
	Aisha Bint Hamad Al Attiyah Hospital	445.29		
	The Cuban Hospital	280.97		
	Women's Wellness and Research Center	536.80		
	Heart Hospital	594.37		
	Ambulatory Care Center	525.71		
	Qatar Rehabilitation Institute	607.68		
	NCCCR	624.71		
	Mental Health Service	343.33		
	Communicable Disease Center	501.30		
Department	Critical Care / Emergency Services	529.34	35.339	< 0.001(KW)*
	Medical Department	430.85		
	Surgical Department	479.99		
	Outpatient (OPD) and Ambulatory Services	600.57		

Note: MW = Mann–Whitney U test; KW = Kruskal–Wallis H test; *$p < 0.05$ indicates statistical significance.

Table 5. *Comparison of Socio-demographic Characteristics and Their Association with Nurses' Satisfaction.*

Educational background also influenced satisfaction, with nurses holding a Master's degree reporting the highest satisfaction, followed by diploma and Bachelor's degree holders (566.21 vs 529.18 vs. 474.27, $p = 0.003$). Job satisfaction differed significantly across hospitals, with QRI reporting the highest and ABAH the lowest (624.71 vs 280.97, $p < 0.001$). Finally, departmental differences were significant, with Outpatient (OPD) and Ambulatory Services showing the highest satisfaction and the Medical Department the lowest (600.57 vs 430.85, $p < 0.001$).

Correlation between Nurse Manager Leadership Styles and Nurses' Satisfaction

The analysis reveals distinct relationships between leadership styles and job satisfaction dimensions (Table 6).

		Intrinsic Satisfaction	Extrinsic Satisfaction	Minnesota Satisfaction Questionnaire (Short Form)
Transformational	Spearman Coefficient (rho)	0.66	0.79	0.73
	p-value	< 0.001*	< 0.001*	< 0.001*
Transactional	Spearman Coefficient (rho)	0.27	0.33	0.30
	p-value	< 0.001*	< 0.001*	< 0.001*
Passive Avoidant	Spearman Coefficient (rho)	0.08	0.04	0.06
	p-value	0.007*	0.142	0.041*

Note: *$p < 0.05$ indicates statistical significance.

Table 6. *Correlation between Nurse Manager Leadership Styles and Nurses' Satisfaction.*

Transformational leadership shows the strongest positive correlations with all forms of satisfaction: intrinsic satisfaction (rho = 0.66, $p < 0.001$), extrinsic satisfaction (rho = 0.79, $p < 0.001$), and overall job satisfaction measured by the Minnesota Satisfaction Questionnaire (MSQ) (rho = 0.73, $p < 0.001$). This suggests that employees who perceive their leaders as inspiring, supportive, and visionary tend to experience higher satisfaction both from the work itself and from external rewards.

Transactional leadership also shows positive but more moderate correlations: intrinsic satisfaction (rho = 0.27, $p < 0.001$), extrinsic satisfaction (rho = 0.33, $p < 0.001$), and overall satisfaction (rho = 0.30, $p < 0.001$). This implies that while reward-based leadership influences job satisfaction, its impact is less pronounced than that of transformational leadership, particularly affecting extrinsic satisfaction. In contrast, passive-avoidant leadership has minimal associations with job satisfaction. The correlations are very weak for intrinsic satisfaction (rho = 0.08, $p = 0.007$) and overall satisfaction (rho = 0.065, $p = 0.041$), and non-significant for extrinsic satisfaction (rho = 0.04, $p = 0.142$). This indicates that passive leadership, marked by inaction and avoidance of responsibility, has little to no effect on employee satisfaction.

Overall, these findings highlight the significant role of transformational leadership in fostering job satisfaction, while transactional leadership has a moderate influence, and passive-avoidant leadership remains largely ineffective. These results confirm that transformational leadership is the most powerful predictor of nurse satisfaction, emphasizing the need for leadership development programs at HMC

DISCUSSION

Demographic and Professional Characteristics

The study sample predominantly comprised female nurses (72.14%), reflecting global trends in nursing gender distribution. The underrepresentation of males (27.86%) highlights ongoing gender disparities in the profession, which may influence workplace dynamics and care delivery. The high proportion of married participants (83.67%) suggests a stable workforce, though potential stressors related to work-life balance warrant consideration. The dominance of Indian (42.14%) and Filipino (33.88%) nationalities aligns with Qatar's reliance on expatriate healthcare workers, raising questions about cultural adaptation and retention strategies. The mean age of 40.40 years and extensive experience (16.85 ± 7.14 years), indicate a mature, seasoned workforce. However, the low

NSC Nursing 2026, Volume 1, Nr. 2 pp 32-58

representation of nurses with ≤5 years of experience (2.14%) may signal challenges in recruiting younger professionals. The predominance of Bachelor's degrees (76.63%) reflects standardization in nursing education, yet the limited advanced degrees (9.18%) suggests opportunities for career development. The concentration of nurses in surgical and medical departments (65.71%) underscores the demand for acute care expertise, while lower representation in specialized units (e.g., Communicable Disease Center) may reflect niche-staffing needs.

Nurse Manager Leadership Styles

The predominance of transactional leadership (mean = 2.57) over transformational styles (mean = 2.20), while passive-avoidant leadership was minimal overall (mean = 1.49) suggests a managerial focus on structured, compliance-driven approaches in this healthcare setting. The reliance on contingent rewards (mean = 2.56) and active monitoring (mean = 2.58) aligns with environments prioritizing task completion over innovation, which may reflect high-pressure clinical demands requiring strict adherence to protocols. However, the low emphasis on individual consideration (mean = 1.94) a core transformational trait indicates missed opportunities for personalized mentorship and emotional support, factors critical for nurse retention and job satisfaction. The moderate to low use of management by exception passive (mean = 1.55) suggests some leaders delay addressing issues until problems escalate, potentially eroding trust. These findings mirror studies where transactional leadership ensures baseline efficiency but fails to inspire long-term commitment [3]. The moderate effectiveness (mean = 2.25) and satisfaction (mean = 2.28) scores further underscore the limitations of overly transactional approaches in fostering intrinsic motivation. Similar patterns have been observed in studies conducted across the Middle East. In this study, transactional leadership dominates, while other studies highlight differences between transformational and transactional leadership styles in healthcare settings. Passive-avoidant leadership remains very rare. A study conducted in Jordan found that respondents perceived

transactional leadership as the most prevalent style among their nurse managers, followed by transformational leadership, with passive-avoidant leadership being the least common [11]. Conversely, two studies conducted in Saudi Arabia reported that transformational leadership was the most dominant style [12,13].

Nurses' Satisfaction

Moderate intrinsic (mean = 2.93) and extrinsic (mean = 2.74) satisfaction scores reveal unmet needs in both personal fulfillment and external rewards. The 20.41% reporting low intrinsic satisfaction suggests gaps in professional growth opportunities, such as limited access to training or leadership roles. Extrinsic dissatisfaction (22.86% low satisfaction) may stem from inflexible schedules, inadequate compensation, or insufficient recognition issues exacerbated by transactional leadership's focus on extrinsic rewards.

In the same regional context, a study conducted in Saudi Arabia also found generally low levels of job satisfaction [14]. In contrast, a study in a public hospital in Poland using the same Minnesota Satisfaction Questionnaire (MSQ) reported higher satisfaction scores, ranging from 3.05 to 3.43, indicating a higher overall level of job satisfaction. In that study, dimensions such as recognition, independence, and working conditions were rated more favorably, and overall satisfaction with work and life was significantly higher [15]. These differences may reflect organizational or leadership factors, such as limited development opportunities or reliance on transactional leadership in our context. Enhancing training access, recognition, and flexibility may help improve satisfaction and address these gaps.

Comparison of Socio-demographic Characteristics and Their Association with Nurses' Satisfaction

Job satisfaction disparities highlight systemic inequities. Females reported higher satisfaction than

males ($p = 0.005$), potentially due to alignment with societal caregiving roles or workplace inclusivity efforts. A study conducted in Poland within a similar context also found a relationship between gender and job satisfaction [15]. Single nurses (mean rank = 550.57) were more satisfied than married or widowed peers, possibly due to fewer work-life conflicts. Somali nurses (mean rank = 665.17) reported the highest satisfaction, while Tunisians (mean rank = 49) expressed profound dissatisfaction, underscoring the impact of cultural integration and institutional support. A cross-sectional survey in Saudi Arabia found significant associations between nationality and lower job satisfaction, particularly when orientation and language support were lacking[16]. Younger nurses (≤30 years) and those with ≤5 years of experience showed higher satisfaction, suggesting optimism or alignment with early-career expectations. Nurses with >15 years at HMC were more satisfied ($p < 0.001$), likely due to career stability or leadership roles. Master's-degree or more holders (mean rank = 566.21) reported greater satisfaction than diploma and bachelor nurses, emphasizing the role of education in professional fulfillment. Hospitals like QRI (mean rank = 624.71) and outpatient departments (mean rank = 600.57) scored highly, possibly due to manageable workloads or patient interaction. Addressing these variations requires culturally sensitive policies and career development pathways. A meta-analysis study reported that the negative impact of nurse burnout on outcomes was not moderated by age, sex, or experience implying demographic factors alone may not drive overall well-being in broader contexts[17].

Correlation between Nurse Manager Leadership Styles and Nurses' Satisfaction

Transformational leadership's exceptionally strong correlation with overall satisfaction (rho = 0.73, $p < 0.001$), and especially extrinsic satisfaction (rho = 0.79, $p < 0.001$), is consistent with Specchia et al.'s systematic review of 12 studies, which identified 9 out of 9 studies showing a positive relationship between transformational behaviors and nurses' job satisfaction[18]. Gebreheat et al.'s integrative review similarly found that 17 out of 17 studies reported a positive impact of

transformational leadership on nurses' job satisfaction[19]. That It is likely due to its emphasis on recognition and shared goals.

Conversely, transactional leadership's moderate correlation with overall satisfaction (rho = 0.30, $p < 0.001$), intrinsic satisfaction (rho = 0.27, $p < 0.001$) and extrinsic satisfaction (rho = 0.33, $p < 0.001$) mirrors Specchia et al.'s finding that four studies observed positive correlations, three found no significant relationship, and one even reported a negative link between transactional behaviors and satisfaction[18]. While contingent rewards can satisfy baseline needs reflected in our moderate extrinsic coefficient, they lack the deeper emotional resonance necessary to engender long-term commitment or intrinsic fulfillment.

Finally, passive-avoidant leadership exhibited negligible associations with all satisfaction metrics (overall rho = 0.06, p = 0.041; intrinsic rho = 0.08, p = 0.007; extrinsic rho = 0.04, p = 0.142), reinforcing Specchia et al.'s observation that three studies documented a negative correlation between passive-avoidant behaviors and nurse satisfaction[18]. When managers abdicate decision-making and fail to provide feedback or recognition, role ambiguity and diminished trust arise, eroding both extrinsic perceptions (no rewards or performance guidance) and intrinsic drivers (no inspiration or support).

Recommendations

The study underscores the critical importance of nurse manager leadership styles in shaping nurses' job satisfaction at HMC. Based on the findings, several recommendations are proposed to enhance satisfaction and overall workplace well-being.

Firstly, HMC should invest in comprehensive leadership training programs that prioritize transformational leadership development. Such programs should focus on building leaders' ability to inspire, empower, and communicate effectively with their teams. Emphasizing qualities such as empathy, recognition, and individualized consideration can strengthen nurses' intrinsic motivation

and sense of belonging, which are key determinants of satisfaction.

Secondly, the organization should foster open communication and participatory decision-making. When nurses are given opportunities to contribute to clinical and administrative decisions, their sense of value and autonomy increases two crucial components of job satisfaction. Leadership practices should therefore promote a culture of inclusion, transparency, and trust across all nursing departments.

In addition, regular satisfaction assessments should be integrated into the organization's quality improvement framework to monitor workforce morale and identify emerging concerns early. Findings from these assessments can inform policy adjustments, recognition systems, and workload management strategies. Finally, HMC should establish mentorship and peer-support programs where experienced leaders and senior nurses can provide guidance and career support, further enhancing job satisfaction and retention among younger or less experienced staff.

Strengths and limitations of the study

This study is characterized by several notable strengths that enhance its credibility and contribution to nursing leadership research. A major strength lies in its large and diverse sample (N = 980), which ensures representativeness across multiple hospitals and departments within HMC. The use of validated instruments, including the Multifactor Leadership Questionnaire (MLQ-5X) for assessing leadership and the Minnesota Satisfaction Questionnaire (MSQ) – Short Form for measuring job satisfaction, ensures psychometric reliability and international comparability.

Furthermore, the study employs rigorous statistical techniques such as Spearman's correlation, Mann–Whitney U, and Kruskal–Wallis H tests to analyze associations between leadership styles and satisfaction outcomes. This comprehensive analytical framework provides robust evidence of the differential effects of transformational, transactional, and passive-avoidant leadership on satisfaction levels. Finally, by situating the research within Qatar's multicultural healthcare context, the study

contributes original insights into how leadership behaviors influence satisfaction in a diverse, expatriate workforce a perspective that is often underrepresented in global nursing literature.

Despite its valuable findings, several limitations must be acknowledged. The cross-sectional design restricts causal inference, meaning that while correlations between leadership styles and satisfaction are established, it cannot be conclusively stated that leadership style directly causes changes in satisfaction levels. Longitudinal studies would be needed to track the evolution of satisfaction over time in response to leadership interventions. Additionally, the use of self-administered questionnaires introduces potential response bias, as participants may have provided socially desirable answers rather than fully objective reflections of their experiences. Common-method bias may also have occurred because both leadership styles and job satisfaction were measured through self-report instruments administered in the same session. The homogeneity of the sample, composed largely of expatriate nurses, limits the generalizability of results to settings with different cultural or workforce compositions. Furthermore, the linguistic and cultural diversity of participants may have affected interpretation or understanding of questionnaire items. The study was conducted exclusively at HMC, meaning institutional factors such as policies, resources, or management structures may have influenced outcomes. Finally, there was limited control for potential confounders, as unmeasured factors such as workload, unit-specific culture, or individual personality traits may also have impacted job satisfaction.

CONCLUSION

This study provides evidence that nurse manager leadership styles significantly influence nurses' job satisfaction at Hamad Medical Corporation (HMC). Transformational leadership emerged as the strongest positive predictor of intrinsic, extrinsic, and overall job satisfaction, suggesting that leaders who inspire, support, and engage their staff foster higher levels of professional fulfillment. Transactional leadership was associated with moderate positive effects, primarily on extrinsic

NSC Nursing 2026, Volume 1, Nr. 2 pp 32-58

satisfaction, while passive-avoidant leadership showed minimal or negligible impact on all satisfaction dimensions.

The study also identified significant variations in job satisfaction across hospitals, departments, nationalities, and educational levels, highlighting the role of organizational context and workforce diversity in shaping nurses' experiences. These findings suggest that targeted interventions promoting transformational leadership behaviors such as mentorship, recognition, and participatory decision-making may enhance nurse satisfaction, retention, and overall workforce stability at HMC.

However, this study has limitations that should be considered when interpreting the results. The cross-sectional design prevents causal inferences, and reliance on self-reported data introduces the potential for response bias and common-method bias. Additionally, linguistic and cultural differences among participants may have influenced responses. Therefore, while the results provide valuable insights for HMC, their generalizability to other healthcare settings is limited, and further research using longitudinal or multi-site designs is recommended.

Local Ethics Committee approval

The study was approved by the Medical Research Center (MRC) – Local Ethics Committee of Hamad Medical Corporation, Qatar (Protocol No. MRC-01-24-356), with approval granted on 15/08/2024, and was conducted in accordance with the principles of the Declaration of Helsinki and Good Clinical Practice (GCP), as well as the regulations of the Ministry of Public Health (MoPH), Qatar. Participant anonymity and data confidentiality were strictly maintained throughout the study.

Conflicts of interest

This study was conducted in accordance with ethical standards. All participants provided informed consent. The authors declare no conflict of interest.

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NSC Nursing 2026, Volume 1, Nr. 2 pp 32-58

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NSC Nursing 2026, Volume 1, Nr. 2 pp 32-58

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Exploring the impact of Nurse Manager Leadership Styles on Nurses' Job Performance at Hamad Medical Corporation: A Cross-Sectional Study

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NSC Nursing 2026, Volume 1, Nr. 3 pp 59-85

ABSTRACT

Introduction: Nurse performance is vital to patient safety and organizational effectiveness. Leadership style is a recognized determinant of performance, influencing consistency, adaptability, and professional growth. Understanding these dynamics is particularly important in multicultural healthcare environments.

Objective: This study explored the impact of nurse manager leadership styles on nurses' job performance at Hamad Medical Corporation (HMC).

Methods: A cross-sectional survey was conducted with 980 registered nurses recruited through random sampling. Data were collected using a structured questionnaire including socio-demographic characteristics, the Multifactor Leadership Questionnaire (MLQ-5X), and the Nursing Performance Instrument (NPI). Data analysis was performed using SPSS version 26, applying descriptive statistics, and Spearman's correlation, Mann–Whitney U, and Kruskal–Wallis H tests.

Results: The workforce was predominantly female (72.1%), married (83.7%), and expatriate, with a mean age of 40.4 years. Transactional leadership (2.57 ±085) was the most common style, followed by transformational (2.20±1.05), while passive-avoidant leadership was minimal (1.49±0.97). Transformational leadership demonstrated strong positive associations with consistency of practice and adaptability. Transactional leadership supported compliance but was less effective in stimulating innovation, while passive-avoidant leadership was negatively correlated with performance outcomes.

Conclusion: Transformational leadership emerged as the most effective style for enhancing nurse performance, while transactional leadership sustained compliance without fostering long-term growth. Strengthening transformational leadership among nurse managers at HMC may improve clinical outcomes, adaptability, and organizational performance.

Keywords: Leadership, Nurses, Job Performance, Practice

INTRODUCTION

In the complex and ever-evolving healthcare environment, the performance of nurses is a cornerstone of quality patient care and organizational success [1–4]. Nurses are at the forefront of healthcare delivery, directly influencing patient outcomes, safety, and satisfaction through their clinical skills, critical thinking, and interpersonal interactions [5–7]. The effectiveness with which nurses execute their duties is not solely dependent on their individual competencies but is significantly shaped by the leadership they receive. Nurse managers, in particular, play a crucial role in fostering an environment that optimizes nursing performance, as their leadership styles directly influence the motivation, development, and productivity of their teams [8].

Job performance in nursing encompasses a broad range of behaviors and outcomes, including adherence to protocols, clinical proficiency, teamwork, communication, and adaptability to challenging situations. High-performing nursing teams contribute to reduced medical errors, improved patient recovery rates, and enhanced overall efficiency within healthcare institutions [9–12]. The leadership styles employed by nurse managers have a profound impact on the performance of their nursing staff. Transformational leadership, characterized by its emphasis on inspiring, empowering, and intellectually stimulating nurses, is often associated with higher levels of performance, as it encourages innovation, professional growth, and a strong sense of ownership [13–16]. This style promotes a positive work environment, which is crucial for fostering high performance. In contrast, transactional leadership, which relies on clear directives, rewards, and corrective actions, can ensure compliance with standards but may not always foster the proactive and adaptive behaviors essential for complex clinical environments [17–19]. Passive-avoidant leadership, marked by a lack of engagement and decision-making, typically has detrimental effects on performance, leading to confusion and disorganization[8]. Recent studies continue to highlight the importance of effective nursing leadership in driving performance outcomes [8,14–19].

While existing literature has explored the relationship between nurse manager leadership styles and

NSC nursing 2026, Volume 1, Nr. 3 pp 59-85

job performance, there remains a specific research gap concerning the context of Qatar. Studie in Qatar have investigated aspects such as the generational gap between nurses and nurse managers and its potential impact on job performance [20] . However, a comprehensive understanding of how various nurse manager leadership styles directly influence the diverse aspects of nurses' job performance within the unique healthcare landscape of Qatar, considering its multicultural workforce and specific organizational structures, is still limited. There is a particular need to understand which leadership styles are most effective in promoting optimal job performance among nurses in HMC, given the specific cultural and organizational dynamics of the region.

Objective

This study aims to investigate the specific influence of nurse manager leadership styles on nurses' job performance at HMC. Specifically, it will examine the relationship between transformational, transactional, and laissez-faire leadership styles and various dimensions of nursing performance. The insights gained will be invaluable for developing targeted leadership training programs and organizational policies designed to optimize nursing performance, ultimately contributing to superior patient care and the sustained success of HMC's healthcare mission.

MATERIALS AND METHODS

Type and Classification of Study

This study employed a quantitative, cross-sectional research design to examine the relationship between nurse manager leadership styles and nurses' job satisfaction, work engagement, and job performance at Hamad Medical Corporation (HMC).

Comparisons and Predictors of Interest

The primary focus was on comparing various nurse manager leadership styles and their respective

impacts on staff nurses' job satisfaction, work engagement, and job performance.

Study Duration

The study was conducted over a period of approximately four months, from November 5, 2024, to March 1, 2025**.**

Sample Size Justification

To ensure reliability and representativeness of the findings, a sample size calculation was conducted based on a population of approximately 12,000 nurses. Using a 95% confidence level and a ±3% margin of error, a sample size of 980 nurses was determined to be appropriate. The sample size was calculated using Cochran's formula:

$$n = \frac{Z^2 p(1-p)}{e^2},$$

where Z = 1.96, p = 0.5, e = 0.03.

The value p=0.5 was selected to provide the most conservative estimate and ensure an adequate sample size in the absence of prior data, while margin of error e = ±3% was chosen to achieve high precision and reliable representativeness of the study results.

Study Population and Setting

The study targeted registered nurses employed across different departments at Hamad Medical Corporation (HMC), Qatar. A simple random sampling procedure was used to select participants. The sampling frame consisted of the complete roster of licensed nurses at HMC, with each nurse assigned a unique identification number. Randomization was performed using Microsoft Excel's RAND function to generate a randomly ordered list.

To mitigate potential non-response, the initial calculated sample of 980 nurses (based on a 95%

confidence level and ±3% margin of error for a population of approximately 12,000 nurses) was increased by 245 nurses, resulting in 1,225 nurses being contacted. The questionnaire was distributed to these nurses via their official HMC email accounts, and 980 responses were received and included in the final study sample. This approach ensured equal probability of selection and broad representation across hospitals and nursing units within HMC.

The study was conducted exclusively within HMC facilities.

Inclusion Criteria

1. Registered nurses currently employed at HMC.
2. Nurses who voluntarily consented to participate.
3. Nurses with a minimum of six months of experience at HMC to ensure familiarity with the organizational culture and leadership practices.

Exclusion Criteria

1. Nurses on leave or absent during data collection.
2. Nurses in managerial or supervisory roles.
3. Contract or temporary nurses.

Data Collection

Data were collected via structured online questionnaires distributed through Google Forms. The survey instruments covered the following areas:

1. *Socio-demographic Data*
2. Collected information included age, gender, nationality, years of nursing experience, tenure at HMC, education level, hospital, and department.
3. *Multifactor Leadership Questionnaire (MLQ-5X)*

This 45-item tool assessed leadership styles (transformational, transactional, and laissez-faire) across dimensions such as inspirational motivation, intellectual stimulation, and contingent reward. Responses were recorded on a 5-point Likert scale (0 = "Not at all" to 4 = "Frequently, if not always") [21].

Items were grouped into their respective leadership dimensions using the MLQ scoring key. For each dimension, a mean score was calculated by summing the responses to the items composing that scale and dividing by the number of valid responses. All leadership style subscales consisted of four items each. Blank or missing responses were excluded from the calculations. Higher mean scores indicated more frequent exhibition of the corresponding leadership behaviors. Leadership dimensions were analyzed as continuous variables rather than categorizing leaders into a single leadership style. The tool demonstrated strong reliability, with Cronbach's alpha ranging from 0.70 to 0.90.

4. *Nursing Performance Instrument (NPI)*

This 20-item instrument assessed nursing performance across clinical and interpersonal dimensions. Responses were rated on a 6-point Likert scale (1 = "Strongly Disagree" to 6 = "Strongly Agree") [22].

NPI scores were calculated by summing the item responses within each domain and dividing by the number of items to obtain mean domain scores. An overall NPI score was computed by averaging all 9 items. Missing responses were excluded from the calculations. Higher scores indicated better perceived nursing performance.

The instrument yielded a Cronbach's alpha of 0.80, indicating strong reliability.

Statistical Considerations and Data Analysis

Primary and Secondary Outcomes

- *Primary Outcomes:* Nurses' job performance.

NSC ursing 2026, Volume 1, Nr. 3 pp 59-85

- *Secondary Outcome:* The relationship between nurse manager leadership styles and the three primary outcomes.

Data Analysis Plan

1. *Descriptive Statistics*

Summarized participant characteristics and key variables using means and standard deviations (mean±SD), or medians and interquartile intervals (IQR), for numerical data, while ranges, and percentages for qualitative and categorical data.

2. *Inferential Statistics*

- Normality of continuous variables was assessed using the Shapiro–Wilk test, which indicated non-normal distribution ($p < 0.05$).
- Spearman's Correlation Coefficient*:* Used to assess associations between leadership styles and outcome variables.
- Mann–Whitney U Test*:* Applied to compare differences in outcome variables between two independent groups
- Kruskal–Wallis H Test*:* Used to compare differences across three or more independent groups
- A p-value (p) < 0.05 was considered statistically significant.

Statistical Software

All analyses were performed using SPSS-26 (Statistical Package for the Social Sciences-26)**.**

Ethical Approval and Informed Consent Statement

Informed consent was obtained from all study participants. The purpose, procedures, and voluntary nature of the study were explained through official internal communication channels via HMC e-mail. Participants provided electronic consent after having at least two months to review the study

information before deciding to participate. Only registered nurses employed at Hamad Medical Corporation (HMC) who met the inclusion criteria were enrolled. No financial incentives were offered for participation.

The study was approved by the Medical Research Center (MRC) – Local Ethics Committee of Hamad Medical Corporation, Qatar (Protocol No. MRC-01-24-356),with approval granted on 15/08/2024, and was conducted in accordance with the principles of the Declaration of Helsinki and Good Clinical Practice (GCP), as well as the regulations of the Ministry of Public Health (MoPH), Qatar. Participant anonymity and data confidentiality were strictly maintained throughout the study.

RESULTS

Demographic and Professional Characteristics

The study sample (N=980) exhibits a predominant representation of females (72.14%)**,** while males account for 27.86%**.** The sex ratio of 0.39 males per female (Table 1).

Characteristics	Categories	Frequency (n)	Percent (%)	Mean± SD	Median (IQR)
Gender	Male	273	27.86		
	Female	707	72.14		
Marital Status	Single	138	14.08		
	Married	820	83.67		
	Widowed	8	0.82		
	Separated / Divorced	14	1.43		
Nationality	Cuban	36	3.67		
	Egyptian	16	1.63		
	Filipino	332	33.88		
	Indian	413	42.14		
	Iranian	3	0.31		
	Jordanian	64	6.53		
	Lebanese	5	0.51		
	Palestinian	8	0.82		
	Somali	3	0.31		
	Sudanese	51	5.20		
	Tunisian	49	5.00		
Age (years)	≤30 years	64	6.53	40.40 ± 7.89	37 (35-46)
	]30-45]	657	67.04		
	> 45	259	26.43		

Table 1. *Demographic Characteristics (N=980)*

NSC Nursing 2026, Volume 1, Nr. 3 pp 59-85

The majority of participants are married (83.67%), with a smaller proportion being single (14.08%) or widowed (0.82%)**.** In terms of nationality, the most represented groups are Indian (42.14%) and Filipino (33.88%)**,** collectively comprising over 75% of the total sample, while other nationalities, such as Jordanian (6.53%), Sudanese (5.20%), and Tunisian (5.0%), are present in smaller proportions. Certain nationalities, including Iranian (0.31%) and Somali (0.31%)**,** have minimal representation. The mean age of the participants is 40.40 ±7.89 years, with a minimum age of 26 years and a maximum age of 62 years. The majority belonging to the 30-45 age group (67.04%), followed by those over 45 years (26.43%), and only a small percentage ≤30 years (6.53%)**.**

The professional characteristics of the study sample (N=980) reveal a workforce with diverse experience levels and educational backgrounds (Table 2). The mean years of experience as a nurse is 16.85 ± 7.14 years, ranging from 3 to 39 years. The majority have 5-15 years of experience (54.29%), followed by those with more than 15 years (43.57%), and a small proportion with ≤5 years (2.14%). Experience within Hamad Medical Corporation (HMC) follows a similar trend, with a mean of 9.93 ± 7.54 years, ranging from 1 to 36 years. The distribution shows that 36.73% have ≤5 years, 37.65% have 5-15 years, and 25.61% have over 15 years of experience in HMC.

Regarding education, the majority hold a Bachelor's degree (76.63%), while 14.18% have a diploma, and 9.18% hold a Master's degree or higher.

The participants are distributed across various hospitals, with the highest representation from Hamad General Hospital (27.55%), followed by Rumailah Hospital (11.63%), Al Wakra Hospital (11.43%), and Women's Wellness and Research Center (8.16%). Other facilities, including specialty hospitals like the Communicable Disease Center (1.53%) and The Cuban Hospital (1.73%), have lower representation.

In terms of departmental distribution, the Surgical Department (35.51%) and Medical Department (30.20%) have the highest number of participants, followed by Critical Care/Emergency Services (22.45%) and Outpatient and Ambulatory Services (11.84%).

Characteristics	Categories	Frequency (n)	Percent (%)	Mean± SD	Median (IQR)
Years of experience as a nurse	≤5 years	21	2.14	16.85 ± 7.14	15(12-22)
	]5-15]	532	54.29		
	> 15	427	43.57		
Years of experience in HMC	≤5 years	360	36.73	9.93 ± 7.54	7(4-17)
	]5-15]	369	37.65		
	> 15	251	25.61		
Educational background	Diploma	139	14.18		
	Bachelor's degree	751	76.63		
	Master's degree	90	9.18		
Hospital	Hamad General Hospital	270	27.55		
	Ambulatory Care Center	58	5.92		
	Qatar Rehabilitation Institute	17	1.73		
	NCCCR	19	1.94		
	Mental Health Service	48	4.90		
	Communicable Disease Center	15	1.53		
	Al Khor Hospital	72	7.35		
	Rumailah Hospital	114	11.63		
	Al Wakra Hospital	112	11.43		
	Hazm Mebaireek General Hospital	64	6.53		
	Aisha Bint Hamad Al Attiyah Hospital	63	6.43		
	The Cuban Hospital	17	1.73		
	Women's Wellness and Research Center	80	8.16		
	Heart Hospital	31	3.16		
Department	Critical Care / Emergency Services	220	22.45		
	Medical Department	296	30.20		
	Surgical Department	348	35.51		
	Outpatient (OPD) and Ambulatory Services	116	11.84		

Table 2. *Professional Characteristics (N=980)*

Nurse Manager Leadership Styles

The results indicate that transactional leadership (2.57±0.85) is more dominant than transformational leadership (2.20±1.05), suggesting that leaders in this sample primarily rely on structured management approaches, such as performance-based rewards (contingent reward, 2.56±1.05) and active monitoring (management by exception – active: 2.58±0.98), rather than

NSC Nursing
2026, Volume 1, Nr. 3 pp 59-85

fostering innovation, motivation, or individualized consideration (Table 3).

	Minimum	Maximum	Mean	S D	Median	Q1	Q3
Idealized Attributes or Idealized Influence (Attributes)	0.00	4.00	2.19	1.14	2.25	1.50	3.00
Idealized Behaviors or Idealized Influence (Behaviors)	0.00	4.00	2.35	1.15	2.50	1.75	3.25
Inspirational Motivation	0.00	4.00	2.34	1.22	2.50	1.50	3.25
Intellectual Stimulation	0.00	4.00	2.21	1.11	2.25	1.50	3.00
Individual Consideration	0.00	4.00	1.94	0.96	2.00	1.25	2.75
Transformational	0.00	4.00	2.20	1.05	2.35	1.55	3.00
Contingent Reward	0.00	4.00	2.56	1.05	2.75	2.00	3.25
Mgmt by Exception (Active)	0.00	4.00	2.58	0.98	2.75	2.00	3.25
Transactional	0.25	4.00	2.57	0.85	2.62	2.00	3.12
Mgmt by Exception (Passive)	0.00	4.00	1.55	1.01	1.25	0.75	2.25
Laissez-Faire	0.00	4.00	1.43	1.05	1.25	0.50	2.25
Passive Avoidant	0.00	4.00	1.49	0.97	1.37	0.75	2.12
Extra Effort	0.00	4.00	2.17	1.20	2.33	1.00	3.00
Effectiveness	0.00	4.00	2.25	1.22	2.50	1.00	3.00
Satisfaction	0.00	4.00	2.28	1.31	2.50	1.00	3.00
Outcomes of Leadership	0.00	400	2.23	1.20	2.42	1.05	3.16

Table 3. *Nurse Manager Leadership Styles*

Within transformational leadership, the highest subscale is idealized influence behaviors (2.35±1.15), indicating that some leaders demonstrate strong role-modeling behaviors. However, individual consideration (1.94±0.96) is the lowest, suggesting that leaders may not provide enough mentorship or personalized support to the nurses.

The passive-avoidant leadership style (1.49±0.97) has the lowest overall scores, particularly laissez-faire leadership (1.43±1.05), indicating that leaders in this sample are generally engaged and do not frequently avoid decision-making. However, the management by exception – passive score (1.55±1.01) suggests that some leaders may still wait until problems arise before taking corrective action.

Regarding leadership outcomes, the scores for effectiveness (2.25±1.22) and satisfaction (2.28±1.31) indicate moderate levels of perceived leader effectiveness and staff satisfaction. Overall

outcomes of leadership (2.23±1.20) reflect a tendency towards average performance across the sample, with some variability.

Nurses' Job Performance

The results of the Nursing Performance Instrument (NPI) and its three subscales reveal interesting insights into the nursing workforce's performance (Table 4).

	Minimum	Maximum	Mean	SD	Median	Q1	Q3
Physical / mental decrement	1.00	6.00	2.91	1.11	3.00	2.00	3.66
Consistent practice	1.00	6.00	4.73	1.29	5.00	4.25	5.75
Behavioral change	1.00	6.00	3.61	1.33	3.50	3.00	4.50
Nursing Performance Instrument (NPI)	1.00	5.78	3.88	0.94	3.88	3.44	4.44

Table 4. *Nurses' Job Performance*

The subscale "Physical/Mental Decrement" had a mean score of 2.91±1.11, suggesting that nurses report a moderate level of physical and mental strain, though it is not perceived as a severe issue overall. The "Consistent Practice" subscale scored the highest, with a mean of 4.73±1.29, indicating that nurses generally perceive themselves as maintaining consistent and stable practices in their roles. The "Behavioral Change" subscale, with a mean of 3.61±1.33, suggests that there is moderate evidence of behavioral changes in nursing practice. Lastly, the overall NPI score of 3.88±0.94 indicates a generally positive view of nursing performance, reflecting a moderate level overall.

Comparison of Socio-demographic Characteristics and Their Association with Nurses' Job Performance

Female nurses had significantly higher job performance than male nurses (mean rank: 536.67 vs. 370.92, $p < 0.001$) (Table 5).

NSC Nursing
2026, Volume 1, Nr. 3 pp 59-85

Characteristics	Categories	Mean Rank	Test	p-value (test)
Gender	Male	370,92	63861,5	< 0.001 (MW)*
	Female	536,67		
Marital Status	Single	551.12	9.513	0.009 (KW)*
	Married	472.37		
	Widowed	457.50		
Nationality	Cuban	268.22	150.584	< 0.001 (KW)*
	Egyptian	389.00		
	Filipino	576.75		
	Indian	498.81		
	Iranian	715.83		
	Jordanian	298.00		
	Lebanese	717.70		
	Palestinian	754.00		
	Somali	649.17		
	Sudanese	486.15		
	Tunisian	198.83		
Age (years)	≤30 years	568.97	29.617	< 0.001 (KW)*
	]30-45]	456.10		
	> 45	558.38		
Years of experience as a nurse	≤5 years	509.26	1.273	0.529 (KW)*
	]5-15]	481.21		
	> 15	501.15		
Years of experience in HMC	≤5 years	472.97	0.003	11.533 (KW)*
	]5-15]	472.07		
	> 15	542.74		
Educational background	Diploma	425.49	9.391	0.009 (KW)*
	Bachelor's degree	498.19		
	Master's degree	526.72		
Hospital	Hamad General Hospital	527.88	61.003	< 0.001(KW)*
	Al Khor Hospital	375.75		
	Rumailah Hospital	428.29		
	Al Wakra Hospital	458.57		
	Hazm Mebaireek General Hospital	500.56		
	Aisha Bint Hamad Al Attiyah Hospital	462.40		
	The Cuban Hospital	263.56		
	Women's Wellness and Research Center	481.40		
	Heart Hospital	607.08		
	Ambulatory Care Center	531.40		
	Qatar Rehabilitation Institute	583.32		
	NCCCR	683.03		
	Mental Health Service	493.17		
	Communicable Disease Center	703.83		
Department	Critical Care / Emergency Services	492.86	43.713	< 0.001(KW)*
	Medical Department	488.47		
	Surgical Department	440.61		
	Outpatient (OPD) and Ambulatory Services	640.84		

Note: MW = Mann–Whitney U test; KW = Kruskal–Wallis H test; *$p < 0.05$ indicates statistical significance.

Table 5. *Comparison of Socio-demographic Characteristics and Their Association with Nurses' Job Performance.*

Single nurses reported the highest performance, followed by married and widowed nurses (551.12 vs. 472.37 vs. 457.50, $p = 0.009$). Significant differences were observed across nationalities, with Palestinian nurses showing the highest performance and Tunisian nurses the lowest (754.00 vs. 198.83, $p < 0.001$).

Regarding age, nurses aged ≤30 years had the highest performance, followed by those >45 years and those aged 30–45 years (568.97 vs. 558.38 vs. 456.10, $p < 0.001$). Years of experience as a nurse were not significantly associated with performance, although nurses with ≤5 years of experience had higher performance than those with >15 years or 5–15 years (509.26 vs. 501.15 vs. 481.21, $p = 0.529$).

Years of experience at HMC were significantly associated with performance, with nurses having >15 years of experience showing the highest performance and those with 5–15 years the lowest (542.74 vs. 472.07, $p = 0.003$). Educational background influenced performance, with nurses holding a Master's degree reporting the highest and those with a diploma the lowest (526.72 vs. 425.49, $p = 0.009$).

Job performance differed significantly across hospitals, with the Mental Health Service reporting the highest and ABAH the lowest performance (703.83 vs. 263.56, $p < 0.001$). Finally, departmental differences were significant, with the Surgical Department showing the highest performance and the Medical Department the lowest (640.84 vs. 440.61, $p < 0.001$).

Correlation between Nurse Manager Leadership Styles and Nurses' Performance

Table 6 explores the relationships between leadership styles and various aspects of nursing performance, including physical/mental decrement, consistent practice, behavioral change, and overall performance measured by the Nursing Performance Instrument (NPI).

Transformational leadership shows a moderate positive correlation with consistent practice (rho = 0.323, p <0.001) and a weak positive correlation with nursing performance (rho = 0.146, $p < 0.001$).

However, there are no significant relationships with physical/mental decrement (rho = 0.017, p = 0.597) or behavioral change (rho = 0.022, p = 0.489). These results suggest that transformational leadership encourages consistent practice and slightly enhances overall performance but does not appear to directly influence nurses' physical or mental well-being or their immediate behavioral adjustments.

		Physical/mental decrement	Consistent practice	Behavioral change	Nursing Performance Instrument (NPI)
Transformational	Spearman Coefficient	0.017	0.323	0.022	0.146
	p-value	0.597	< 0.001	0.489	<0.001
Transactional	Spearman Coefficient	-0.277	-0.055	-0.339	-0.230
	p-value	< 0.001	0.083	< 0.001	< 0.001
Passive Avoidant	Spearman Coefficient	0.038	-0.073	-0.087	-0.121
	p-value	0.233	0.022	0.006	< 0.001

Table 6. *Correlation between Nurse Manager Leadership Styles and Nurses' Performance.*

Transactional leadership presents a negative correlation with physical/mental decrement (rho = -0.277, $p < 0.001$), behavioral change (rho = -0.339, $p < 0.001$), and nursing performance (rho = -0.230, $p < 0.001$). The correlation with consistent practice is not significant (rho = -0.055, p = 0.083). These findings imply that transactional leadership may be associated with declines in behavioral adaptability and overall performance, potentially reflecting a rigid, reward-punishment dynamic that does not foster flexibility or proactive nursing behaviors.

Passive-avoidant leadership demonstrates weak negative correlations with consistent practice (rho = -0.073, p = 0.022), behavioral change (rho = -0.087, p = 0.006), and nursing performance (rho = -0.121, $p < 0.001$), though no significant relationship is found with physical/mental decrement (rho = 0.038, p = 0.233). This suggests that passive-avoidant leadership slightly undermines effective nursing practices and performance, likely due to a lack of guidance and support.

In summary, transformational leadership has the most positive influence, especially on consistent practice and overall nursing performance. In contrast, transactional leadership seems linked to negative outcomes, particularly regarding behavioral flexibility and performance, while passive-avoidant leadership also has small but significant negative effects.

DISCUSSION

Demographic and Professional Characteristics

The demographic characteristics of the sample provide important context for interpreting job performance outcomes. The high representation of women (72.14%) is consistent with the global nursing workforce [23,24], though the smaller proportion of men (27.86%) may affect team diversity and performance styles [25]. The predominance of married nurses (83.67%) suggests stability, yet also underscores the dual stressors of family and professional responsibilities, which can affect concentration and efficiency [26,27]. The reliance on expatriate staff, especially Indian (42.14%) and Filipino (33.88%) nurses, reflects regional workforce trends but introduces cultural adaptation challenges that may shape performance consistency [28]. The average age (40.40 years) and extensive experience (16.85±7.14 years) demonstrate a mature workforce capable of sustaining performance. However, the limited presence of younger nurses (≤5 years' experience, 2.14%) may hinder succession planning and innovation. The predominance of bachelor's degrees (76.63%) indicates solid educational preparation, though the limited advanced degrees (9.18%) highlight opportunities to strengthen specialized competencies.

Nurse Manager Leadership Styles

Leadership findings confirmed transactional leadership (2.57±085) as the dominant style, with contingent rewards (2.56±1.05) and active monitoring (2.58±0.98) driving structured compliance. While these strategies ensure adherence to standards, they may not stimulate the innovation and

NSC nursing 2026, Volume 1, Nr. 3 pp 59-85

adaptability increasingly demanded in modern healthcare settings [15,18]. The low emphasis on individual consideration (1.94±0.96) suggests a lack of personalized development, limiting opportunities for performance growth [8]. By contrast, transformational leadership has been consistently linked to enhanced job performance across diverse contexts [14,16]. Although passive-avoidant leadership (1.49±0.97) was rare, its occasional presence risks undermining performance through delayed intervention. These results suggest that adopting transformational leadership at HMC could strengthen consistency, adaptability, and clinical performance.

Nurses' Job Performance

The high consistent practice scores (4.73±1.29) highlight nurses' reliability in adhering to established protocols, a strength in error-prone healthcare settings. However, moderate behavioral change (3.61±1.33) signals resistance to adapting workflows, possibly due to rigid transactional leadership or fear of reprisal for deviations. The overall performance score (NPI = 3.88) suggests competence but not excellence, aligning with environments prioritizing compliance over innovation. Notably, physical/mental decrement (2.91±1.11) indicates that strain, while not severe, may hinder proactive initiatives. In a similar context in Iran, nurse performance was also reported at a moderate level, with the general performance aspect receiving the highest average score and the mental aspect the lowest [29].

Comparison of Socio-demographic Characteristics and Their Association with Nurses' Job Performance

Job performance varied markedly across demographics. Females outperformed males ($p < 0.001$), aligning with a study conducted in the same context in Jordan, a Middle Eastern country, which linked female nurses to higher job performance [30]. This gender gap may reflect both enduring social norms around caring roles and targeted soft-skills training that disproportionately benefits

female practitioners.

Single nurses showed higher performance (mean rank = 551.12) than married or widowed peers, possibly due to fewer familial responsibilities or greater focus on career progression. This contrasts with studies conducted in Jordan and Turkey, which found no significant relationship between marital status and job performance [30,31]. Nationality-based differences were stark: Palestinian nurses (mean rank = 754.00) excelled, while Tunisians (mean rank = 198.83) underperformed. This may reflect disparities in training quality, language proficiency, or workplace integration. Younger nurses (≤30 years) outperformed older colleagues ($p < 0.001$), suggesting adaptability to new protocols or technologies. Paradoxically, nurses with >15 years of HMC experience also performed well, indicating that institutional knowledge complements innovation. In the same context, a study conducted in Jordan found that age and experience were related to job performance [30].

Master's-trained nurses (mean rank = 526.72) outperformed diploma holders, underscoring the value of advanced education in clinical decision-making. Hospitals like the Mental Health Service (mean rank = 703.83). Surgical departments (mean rank = 640.84) reported superior performance, likely due to specialized workflows or interdisciplinary collaboration. These findings advocate for competency-based training and equitable recognition of diverse backgrounds.

Correlation between Nurse Manager Leadership Styles and Nurses' Job Performance

Transformational leadership moderately enhanced consistent practice (rho = 0.323, $p < 0.001$) but had no impact on behavioral change, suggesting it fosters reliability over innovation. The findings partially align with those reported by Mohammed Qtait on 2023, who conducted a systematic review of 12 quantitative studies investigating the relationship between leadership styles and nurse performance, reports that transformational leadership had the strongest positive correlation enhancing nursing care quality, job satisfaction, motivation, and patient outcomes [8].

Transactional leadership correlated negatively with performance (rho = -0.230, $p < 0.001$),

particularly behavioral change (rho = -0.339, $p < 0.001$), implying rigid reward-punishment systems hinder adaptability. However, Qtait's review found a moderate positive correlation between transactional leadership and nurse performance, indicating some benefits under structured systems [8].

Passive-avoidant leadership also undermined performance (rho = -0.121, $p < 0.001$), in line with Qtait's conclusion that laissez-faire leadership had weak or no positive impact [8]. This consistent finding emphasizes that ambiguity, lack of guidance, and disengagement by leaders can significantly reduce nurse motivation and clarity in roles.

Recommendations

The findings of this study highlight the critical need to strengthen *transformational leadership competencies* among nurse managers at Hamad Medical Corporation (HMC). It is recommended that HMC invest in ongoing leadership development programs that emphasize communication, motivation, and professional empowerment to promote inspiring and participative managerial behaviors. Transformational leadership, by encouraging autonomy and creativity, can significantly enhance both individual and collective nursing performance, fostering consistency in clinical practice and adaptability in complex healthcare settings.

Furthermore, leadership competency assessments should be integrated into managerial performance evaluations to ensure that adopted leadership styles align with organizational goals and contribute to nurse productivity and job satisfaction. Organizational culture should also move toward reducing overreliance on transactional leadership**,** which focuses primarily on control and rewards, and instead foster more collaborative, innovative, and supportive leadership approaches.

Finally, creating a psychologically and physically supportive work environment **is** essential to reduce stress and fatigue among nurses, both of which can negatively affect long-term job performance

Strengths and limitations of the study

This study possesses several methodological strengths that enhance its scientific credibility. First, the use of a large and randomly selected sample (N = 980) provides strong representativeness and statistical reliability. The application of validated international instruments, namely the Multifactor Leadership Questionnaire (MLQ-5X) for assessing leadership styles and the Nursing Performance Instrument (NPI) for measuring clinical performance, adds to the study's methodological rigor. Moreover, the use of robust statistical analyses including Spearman's correlation, Mann–Whitney U, and Kruskal–Wallis H tests enabled comprehensive exploration of relationships between leadership styles and various aspects of job performance, providing a multidimensional understanding of these dynamics. Despite its strengths, the study also presents certain limitations. The most significant is its cross-sectional design, which limits the ability to infer causality between leadership style and nurse performance. It remains unclear whether transformational leadership directly improves performance, or whether nurses who perform better perceive their leaders as more transformational. Additionally, self-reported data may have introduced response bias, as participants could overestimate their performance due to social desirability or professional pride. Studies would provide a broader and more causal understanding of these leadership–performance relationships.

CONCLUSION

This study clearly demonstrates that nurse manager leadership styles have a significant and differentiated impact on nurses' job performance within Hamad Medical Corporation. The results reveal that transformational leadership exerts the most substantial positive effect, enhancing consistency in clinical practice, adaptability to change, and overall professional performance. Nurses who perceive their leaders as visionary, supportive, and encouraging are more motivated, committed, and productive. These findings align with international literature showing that transformational leaders foster collaboration, reduce clinical errors, and improve both patient

NSC ursing 2026, Volume 1, Nr. 3 pp 59-85

outcomes and staff well-being. In contrast, transactional leadership, while effective in maintaining compliance and operational discipline, tends to have limited influence on creativity and long-term professional growth. Its focus on control and reward systems may sustain performance in routine tasks but fails to nurture the initiative and innovation required in dynamic healthcare environments. On the other hand, passive-avoidant leadership emerges as the least effective style, being associated with disorganization, lack of motivation, and decreased performance due to minimal managerial involvement or guidance.

The implications for nursing leadership are profound. Developing a structured and culturally adaptive transformational leadership model should be a strategic priority for HMC. Such an approach can strengthen clinical performance, enhance innovation, reduce turnover, and promote a collaborative culture focused on quality and patient safety. Ultimately, this study underscores that effective leadership in nursing transcends task management it is fundamentally about mobilizing human potential to achieve excellence, empowerment, and resilience within healthcare organizations.

Local Ethics Committee approval

The study was approved by the Medical Research Center (MRC) – Local Ethics Committee of Hamad Medical Corporation, Qatar (Protocol No. MRC-01-24-356) and was conducted in accordance with the principles of the Declaration of Helsinki and Good Clinical Practice (GCP), as well as the regulations of the Ministry of Public Health (MoPH), Qatar. Participant anonymity and data confidentiality were strictly maintained throughout the study.

Conflicts of interest

This study was conducted in accordance with ethical standards. All participants provided informed consent. The authors declare no conflict of interest.

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NSC ursing 2026, Volume 1, Nr. 3 pp 59-85

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Competencies of Nursing Tutors in Clinical Training: A Nationwide Italian Survey Protocol

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Study protocol

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ABSTRACT

Introduction: Clinical mentoring is essential for nursing education. It facilitates the integration of theory and practice, while promoting the development of clinical, communication, and interpersonal skills. It is becoming increasingly evident that tutors are facing a number of challenges. These challenges are related to the cultural diversity of students and constantly evolving clinical contexts. Despite the emphasis placed on the significance of general and cultural competencies in mentors within the context of international literature, a paucity of studies in Italy exists that evaluate both dimensions employing standardised and validated tools.

Objective: This protocol describes a nationwide survey that will assess the mentoring and cultural competencies of Italian nursing tutors.

Methods: The study adopts a descriptive cross-sectional observational design, with convenience sampling of approximately 600 tutors active in the academic year 2024–2025. The collection of data will be conducted between July and December 2025 through the utilisation of digital questionnaires. The survey employs two instruments, namely the Mentors' Competence Instrument (MCI) and the Mentors' Cultural Competence Instrument (MCCI), in order to assess these competencies. The MCI has been developed to measure tutors' general skills, including pedagogical, relational and feedback dimensions, while the MCCI has been developed to assess cultural skills and intercultural communication. The collection of sociodemographic data, contextual information and open-ended responses pertaining to the strengths and weaknesses of the tutorial role will also be undertaken. Statistical procedures will include descriptive analyses, using tables and plots to represent the data, as well as inferential analyses such as the Chi-square test, t-test, ANOVA test, Mann–Whitney U test, Kruskal–Wallis test, and correlation analysis. All statistical tests with $p < 0.05$ will be considered statistically significant.

Results: The results of the study will inform the development of targeted training interventions and organisational strategies to enhance the role of the clinical tutor.

NSC nursing 2026, Volume 1, Nr. 4 pp 86-101

Conclusions: The survey will contribute to the enhancement of mentoring quality and the professional development of tutors, thereby facilitating the strengthening of the effectiveness of clinical training programmes in Italy.

Keywords: mentoring, nursing tutor, cultural skills, survey, clinical training.

INTRODUCTION

Clinical mentoring is a fundamental pillar of nursing education. It guides students in integrating theory and practice, while also promoting the development of clinical, communication, and interpersonal skills [1]. Changes in healthcare contexts and the increasing cultural and linguistic diversity of students mean that the role of the tutor is becoming more complex and important [2]. International literature shows that effective tutoring improves student satisfaction, reduces anxiety, and contributes to patient safety [3]. Furthermore, Directive 2013/55/EU [4] stipulates that at least 50% of nursing training must take place in clinical settings, thereby expanding the responsibilities of tutors and necessitating their adequate preparation.

In recent years, research has further defined the multidimensional nature of the skills required of tutors [5]. Pramila-Savukoski et al. [6] have emphasised that these skills encompass pedagogical, organisational, and professional elements. In this context, the Mentors' Competence Instrument (MCI), which was developed and validated by Tuomikoski et al. [7], is a standardised self-assessment tool that is widely used to evaluate the general abilities of nursing tutors. This evaluation covers areas such as pedagogical knowledge, relationships between mentors and students, providing feedback, and assessing students. Added to this is cultural competence, which is essential in supporting students from different backgrounds. Luukkonen et al.'s [8] study showed that, despite having moderate levels of cultural awareness, tutors demonstrate gaps in their practical interaction skills and cultural confidence, with variability related to age, experience, and the

frequency with which they deliver tutorials.

A key contribution to this field is the work of Oikarainen et al. [9], who developed and validated the Mentors' Cultural Competence Instrument (MCCI). This is now considered one of the most comprehensive tools for measuring the cultural competence of tutors. Meanwhile, Giusti and Mazzotta [10] emphasised the pivotal role of tutors in fostering cultural competence among nursing students and facilitating the establishment of inclusive clinical environments.

Further evidence at the European level comes from a multicentre study by Mikkonen et al. [11], which identified three distinct profiles of tutorial competence among over 1,600 mentors from five European countries. The study showed that professional experience, specific training, and the frequency with which mentors undertake tutoring activities are correlated with higher levels of competence. Italian mentors, however, scored lower in several areas, including providing constructive feedback, adopting a goal-oriented approach to mentoring, and engaging in critical reflection [11], these results suggest the need for dedicated training programmes in an Italian context. Meanwhile, a recent systematic review by Keinänen et al. [12] confirmed that educational interventions aimed at tutors can significantly improve skills such as student assessment, providing feedback, setting goals, and developing professional self-efficacy. The analysed interventions, which were often based on blended methods, demonstrated consistent and significant improvements in various dimensions of tutorial competence over time [12].

In nursing education literature, the term *mentor* is often used interchangeably with other roles such as facilitator, peer instructor, preceptor, clinical guide, clinical instructor, or supervisor [7]. In this context, a mentor can be defined as a registered nurse who supports undergraduate nursing students in their learning process and is responsible for teaching and assessing students during clinical practice, without being an employee of the educational institution. Mentoring takes place within the clinical learning environment, which encompasses not only the physical setting but also psychosocial and interactional factors, organisational culture, and teaching and learning components

NSC Nursing 2026, Volume 1, Nr. 4 pp 86-101

that can strongly influence students' learning experiences.

In the Italian context, these mentoring functions are often carried out within tutoring activities, reflecting a partial overlap between the roles of mentor and tutor in clinical education.

However, the national literature shows that there are not many studies that look at the general and cultural skills of Italian nursing tutors using standard tools like the MCI and MCCI.

Objective

The aim of this protocol is to address this gap by conducting a national survey using the MCI and MCCI questionnaires.

MATERIALS AND METHODS

Study design

The study adopts a descriptive cross-sectional observational design, based on the administration of a survey aimed at nurses who act as clinical tutors in Nursing Degree Courses in Italy, active in the academic year 2024–2025. The collection of data is scheduled to take place between July and December 2025. The study was registered on the OSF platform [13].

The cross-sectional design was selected to provide a comprehensive overview of the general and cultural competencies of nursing tutors within the context of university education, offering a representative sample of the prevailing circumstances at the time of the survey. This approach aligns with the established guidelines for conducting and reporting observational studies and surveys in the healthcare sector [14,15].

Population and sample

The target population of the study consists of nurses who have provided clinical tutoring for students enrolled in nursing degree programmes during the 2024–2025 academic year. These nurses

are employed within healthcare facilities and universities that are affiliated with the training programmes.

Convenience sampling was employed due to the unavailability of a reliable estimate of the total number of nurse tutors at the national level. The use of random sampling was not feasible due to the absence of a national registry or comprehensive database of nurse tutors in Italy, as well as the heterogeneity of the tutor role across institutions.

Participants will be recruited through institutional and professional channels, including nursing degree programme coordinators, internship coordinators, and professional nursing networks, in accordance with the methodology of descriptive surveys in nursing [16].

Given the descriptive and non-probabilistic nature of the study, a formal sample size calculation was not performed. The target sample size of approximately 600 participants was defined pragmatically, with the aim of achieving broad national coverage and ensuring sufficient variability for descriptive and exploratory analyses, as is recommended for descriptive studies not intended for hypothesis testing [15,16].

The study will include nurses who have been employed as clinical tutors during the 2024–2025 academic year. Individuals in managerial roles, those who have been absent for extended periods (e.g., due to illness or pregnancy), and those who have experienced a demotion or downgrade in their professional positions are excluded from this study.

No minimum duration of tutoring experience or formal tutor training was required for inclusion, as the study aims to reflect the heterogeneity of tutoring practices in the Italian clinical education context. Tutor training and professional experience were collected as study variables rather than used as exclusion criteria.

Survey instruments

The questionnaire is composed of three sequential sections.

NSC Nursing 2026, Volume 1, Nr. 4 pp 86-101

Preliminary section:

The first section collects socio-demographic and professional information about the respondents. Specifically, the following variables will be collected: age, gender, highest educational qualification, years of professional nursing experience, years of experience in clinical tutoring, current clinical setting, geographical region, prior formal training as a tutor (yes/no), and formal recognition of the tutoring role within the workplace (yes/no). This information will be used to describe the sample and to explore potential associations with mentoring competencies.

Mentors' Competence Instrument (MCI)

The second section consists of the Mentors' Competence Instrument (MCI), developed by Tuomikoski et al. [7] and validated in the Italian context [17], based on the 7-factor model. The instrument includes 63 items distributed across seven domains: (1) mentoring practices, (2) mentor characteristics, (3) mentor motivation, (4) goal-oriented mentoring, (5) reflection during mentoring, (6) student-centred evaluation, and (7) constructive feedback and assessment. Items are rated on a 4-point Likert scale ranging from "strongly disagree" to "strongly agree," with higher scores indicating higher perceived mentoring competence.

The Italian version of the MCI has demonstrated good psychometric properties, with satisfactory construct validity and internal consistency, reporting Cronbach's alpha values ranging approximately from 0.76 to 0.90 across domains [7].

Mentors' Cultural Competence Instrument (MCCI):

The third section includes the Mentors' Cultural Competence Instrument (MCCI), developed and validated by Oikarainen et al. [9], developed to assess cultural competence in mentoring culturally and linguistically diverse nursing students. The instrument comprises 13 items organised into domains addressing cultural awareness, cultural sensitivity, intercultural communication, and

linguistic diversity. Responses are measured using a 4-point Likert scale (“strongly disagree” to “strongly agree”), with higher scores reflecting higher perceived cultural competence. The Italian version of the MCCI has shown acceptable validity and reliability, with evidence of construct validity and good internal consistency across domains.

Bringing MCI and MCCI together will provide a complete and detailed understanding of the tutor's role. This will include both the usual teaching skills and those that are growing in the area of cultural diversity. The original authors of the instruments authorised the researchers to use the instruments on 22/05/2025.

The survey will also comprise three optional open-ended questions with optional answers, inviting respondents to describe the role of the tutor and the strengths and weaknesses of current nursing students.

Data collection procedures

The administration of the questionnaires will be conducted digitally, utilising the Microsoft Form™ platform (Microsoft Corp., Redmond, WA, USA) [18]. The data collection period is scheduled to occur between September and December 2025. The survey will be distributed using a combination of methods: a direct web link disseminated through Nursing Degree Programme Coordinators and internship coordinators at participating universities, and QR codes shared during educational and professional training events targeting nursing tutors.To minimise the risk of unauthorised access or duplicate responses, the survey platform will implement IP address tracking, allowing only one submission per device. Participation will be anonymous, and no personally identifiable information will be collected. A system of periodic reminders will be employed to enhance response rates. Reminder messages will be sent at fortnightly intervals throughout the data collection period. Data confidentiality will be ensured through secure data management procedures. All collected data will be stored exclusively on a password-protected external hard drive, with encrypted access enabled

via the BitLocker security system of Windows 10® (Microsoft Corporation, WA, USA). Data will be accessible only to the research team and will be handled in accordance with applicable data protection regulations.

Data analysis

The survey data will be entered into a Microsoft Excel™ 2019 spreadsheet (Microsoft Corp., Redmond, WA, USA) and quality checked by a researcher to ensure accuracy. All responses remain anonymous. The questionnaire will not identify participants. Upon reaching the target sample size or by 31 December 2025, the data will be exported to Excel™ and subsequently analysed using SPSS™ software, version 27 [19]. The statistical analysis will follow a progressive approach: initially, descriptive statistics will be calculated, such as frequencies and percentages for categorical variables, means and standard deviations or medians and interquartile ranges for continuous variables, after verifying the distribution of the data using normality tests.

Inferential analyses will include Chi-square tests to assess associations between categorical variables. For continuous variables, data distribution will be assessed using tests of normality. Parametric tests (t-test or ANOVA) will be applied to normally distributed variables, while non-parametric alternatives (Mann–Whitney U test or Kruskal–Wallis test) will be used when normality assumptions are not met. The level of statistical significance will be set at $p < 0.05$.

In addition, correlation analyses will be performed to explore associations between continuous competence scores (overall and domain-specific scores of the Mentors’ Competence Instrument and the Mentors’ Cultural Competence Instrument) and selected socio-demographic and professional variables, such as age, years of professional experience, years of tutoring experience, and prior tutor training. Pearson’s correlation coefficient will be used for normally distributed continuous variables, while Spearman’s rank correlation coefficient will be applied for non-normally distributed or ordinal variables. These analyses will be exploratory in nature.

Responses to the open-ended questions will be analysed using a qualitative thematic analysis approach. The analysis will involve familiarisation with the textual data, inductive coding, and the identification of recurring patterns and themes. The qualitative results will be used to complement the quantitative findings and provide a deeper understanding of tutors' perceptions regarding their role and the strengths and weaknesses of nursing students.

Ethical considerations

The study will be conducted in full compliance with the principles of the Declaration of Helsinki. All participants will receive comprehensive information regarding the objectives and methodologies of the research and will be able to provide their free and informed consent. Participation is voluntary and anonymous: no personal data or information that could directly or indirectly identify participants will be collected. The data shall be used exclusively for scientific research purposes and shall be processed in accordance with Italian law, Legislative Decree No. 196 of 30 June 2003, "Personal Data Protection Code" [20], updated with the new Legislative Decree No. 101/2018 [21], which adapts Italian legislation to the European privacy regulation (EU Reg. No. 679/2016, GDPR) [22]. The study was approved by the Regional Ethics Committee of the Umbria Region on June 18, 2025 (Prot. No. CE-2376/25).

RESULTS

Reporting results

The presentation of results will adhere to the guidelines of the CHERRIES checklist [23], the CROSS Checklist [24] and the recommendations published by Latour and Tume [25], ensuring consistency, transparency and completeness in survey reporting and compliance with international best practices for the description of questionnaire-based studies.

NSC ursing 2026, Volume 1, Nr. 4 pp 86-101

Expected outcomes

The survey is expected to provide a clear and detailed description of the current mentoring and cultural competence profiles of Italian nursing tutors, based on domain-specific scores obtained from validated instruments. The integration of the MCI and MCCI will facilitate the delineation of an overall profile of the clinical tutor, emphasising their strengths and areas for improvement, as well as identifying potential disparities associated with the socio-demographic and professional characteristics of the participants. The data collected will also facilitate the exploratory identification of associations and correlations between mentoring and cultural competence scores and selected socio-demographic and professional variables. The study is expected to provide valuable information to guide institutional strategies for enhancing the role of tutors and improving the quality of clinical training programmes.

LIMITATIONS AND STRENGTHS

Limitations

The study is subject to certain inherent limitations, which are intrinsic to the adopted methodological framework. The utilisation of convenience sampling has the potential to compromise the representativeness of the sample with respect to the national population of nursing tutors. Furthermore, the utilisation of self-assessment tools carries with it the risk of bias, as participants may overestimate or underestimate their own skills. Finally, voluntary participation may favour responses from individuals who are more motivated or sensitive to the topic, thus introducing the possibility of a self-selection bias.

Strengths

A significant strength of the study is the utilisation of two internationally validated instruments, which ensure the reliability and comparability of the data collected. The magnitude of the sample in

question serves to enhance the robustness of the statistical analyses conducted, thereby facilitating the identification of potential associations between the various variables under consideration. The content explored is of particular significance for improving mentoring practices and enhancing the role of the clinical tutor, due to its relevance to training needs and organisational policies in the field of nursing education.

CONCLUSION

The present protocol delineates a national survey designed to evaluate the general and cultural competencies of nursing tutors through the MCI and MCCI. The anticipated outcomes of this study are expected to provide valuable insights that will inform the development of training programmes, the enhancement of the quality of clinical placements, and the strengthening of the role of tutors in nursing education.

Author contributions

Conceptualization: G.D.G.

Methodology: G.D.G.; A.G.

Writing—original draft preparation: G.D.G.; Y.L.; S.B.; R.M.

Writing—review and editing: G.D.G.; Y.L.; S.B.;

Supervision: S.B.; Y.L.; R.M.

Ethics statement

The study will be conducted in full compliance with the principles of the Declaration of Helsinki. The study was approved by the Regional Ethics Committee of the Umbria Region on 18/06/2025 (Prot. No. CE-2376/25).

NSC nursing 2026, Volume 1, Nr. 4 pp 86-101

Conflicts of interest

The authors declare no conflicts of interest.

Funding sources

This research received no external funding

Declaration on the use of ai

We used ChatGPT and DeepL.com to assist with English language refinement and grammar checking. No AI was used for interpretation, or scientific content generation.

Data availability statement

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

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NSC ursing 2026, Volume 1, Nr. 4 pp 86-101

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LOCAL EXPERIENCE OF COORDINATION IN ROBOTIC SURGERY: ORGANIZATIONAL REFLECTIONS

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Commentary

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ABSTRACT

Introduction: The launch of the robotic surgery program in our hospital showed that the main challenges did not concern the technology itself but rather the organization of work. Delays in operating room preparation, unclear task distribution, fragmented communication among professionals, and inconsistent management of instrument traceability highlighted the absence of a clearly defined coordination function.

Methods: Through descriptive observations drawn from daily activity during the initial phases of the program, operational episodes, team dynamics, and workflow patterns were recorded in order to understand how the system adapted to the introduction of the robotic platform.

Results: From these observations, the figure of the "Da Vinci Coordinator" (DVC) emerged locally as a practical response to organizational challenges. This function contributed to aligning tasks among teams, making workflow preparation more predictable, improving interprofessional communication, and supporting internal training activities. The few descriptive indicators included served solely to contextualize the experience.

Conclusion: The DVC function was not conceived as a formalized or generalizable professional role, but rather as an emergent organizational adaptation useful during the implementation phase of a robotic program. The considerations presented may offer insights for other centers preparing to introduce robotic surgery; however, further structured studies will be necessary to assess its transferability to different contexts.

Keywords: Robotic surgery; perioperative coordination; organisational role; instrument traceability; Team integration; Da Vinci system

NSC Nursing 2026, Volume 1, Nr. 5 pp 102-115

INTRODUCTION

Robotic surgery is increasingly used to support minimally invasive procedures, with well-documented advantages in precision, patient safety, length of stay, and postoperative recovery [1–5]. In January 2025, the Umberto I Hospital of Nocera Inferiore introduced the Da Vinci system within the ASL Salerno network. Although robotic platforms are typically associated with technological benefits, our early implementation phase highlighted challenges of a different nature: the most recurrent difficulties were organizational rather than technical. During the first weeks, we observed delays in operating room start times, unclear task allocation during system preparation, fragmented communication among surgical, anesthesiology, nursing, and technical staff, and inconsistent procedures for instrument traceability and expiry control. The lack of a standardized monitoring protocol also resulted in occasions where robotic instruments exceeded their prescribed service life without timely identification, creating risks of unavailability or malfunction [6]. These observations underscored a key insight: in the start-up phase of a robotic program, patient safety and workflow stability depend not only on technology or surgical skill, but also on a clearly defined coordination function capable of integrating clinical, technical, and organizational activities across the perioperative pathway [7]. To address these gaps, our center introduced the Da Vinci Coordinator (DVC), conceptualized as a coordination function rather than a formal professional role and assigned to an experienced operating room nurse trained on the robotic system. The role emerged as a practical response to early challenges and was maintained as staff increasingly recognized its value for workflow predictability, interprofessional communication, and training support.

Objective

The purpose of this commentary is to explain why this coordination function became necessary during the early implementation phase, to describe its main activities, and to reflect on how this experience may support other centers preparing to introduce robotic surgery.

Rationale behind the introduction of the Da Vinci Coordinator

During the first weeks of using the robotic system, our local experience revealed a recurrent organizational need that may be relevant for other centres starting a robotic programme [8]. In response, the hospital established a multidisciplinary working group including surgeons, anesthesiologists, and operating room nurses to review early operational episodes and identify practical priorities. These discussions motivated the introduction of the Da Vinci Coordinator (DVC), assigned in our unit to a single operating room nurse with advanced competencies and specific training on the robotic system and its instruments. Initially introduced as a pragmatic solution to early-stage challenges, the DVC function was subsequently maintained as staff perceived clear benefits in workflow predictability, standardization of preparation, and interprofessional collaboration elements that are critical for supporting safe, patient-centered care during the start-up of a robotic program. In our setting, the essential activities observed included (Figure 1):

Figure 1. *Key competence that may have the Da Vinci Coordinator.*

(1) Technical supervision of system readiness and troubleshooting; (2) Organizational coordination to align workflow and responsibilities; (3) Interprofessional training supporting the team's learning process. These activities reflect a context-dependent coordination function rather than a formal professional standard, illustrating how dedicated coordination mechanisms may be essential during early robotic implementation. In our setting, the DVC was conceptualized as a distinct coordination function compared with the standard operating room nurse [9].

Clinical, technical, and organizational skills (locally observed)

In the context of our start-up phase, the DVC role integrated clinical competencies (procedure-specific patient positioning), technical competencies (system readiness verification, troubleshooting and escalation pathways, instrument traceability, and management of usage life and expiry), and organizational competencies (workflow preparation, clarification of professional roles, facilitation of multidisciplinary communication, and provision of training support). These competencies are presented as context-dependent observations derived from a single-center implementation phase and do not constitute a formally codified professional standard (Table 1).

Aspect	**Traditional OR Nurse** [10]	**Da Vinci Coordinator (DVC)** [Fig. 2]
Role focus	Intraoperative assistance	Coordination across the robotic surgical pathway
Competence	Primarily clinical intraoperative skills	Integrated clinical, technical, and organizational skills
Instrument management	Basic instrument control	Traceability, usage-life checks, system readiness verification
Team interaction	Interaction with surgeons, anesthesiologists, OR nurses and technical/support staff)	Cross-team communication among the same professional groups
Training role	Limited or none	Support to onboarding and standardized setup routines
Responsibility procedure-based	Focused on the current procedure	Coordination of preparation and workflow across sessions (context-dependent)

Table 1. *Preliminary, locally observed functional comparison between the traditional OR nurse role and the coordination function referred to as "Da Vinci Coordinator (DVC)" in our setting*.

Core skills and tasks of the Da Vinci Coordinator (locally observed)

In our setting, the DVC combines clinical, technical, and organisational support (Table 1; Figure 2). Rather than providing a procedural checklist, we summarise the DVC contribution as a coordination function across perioperative phases, aimed at reducing variability and making interdependencies manageable during the start-up period.

Across phases, three recurrent coordination mechanisms were observed:

- Before surgery: aligning timing and responsibilities; verifying instrument readiness and traceability/usage-life; ensuring basic system readiness.
- During surgery (setup/docking): facilitating bidirectional communication among teams; supporting standardised setup routines; coordinating escalation when technical or workflow disruptions occur.
- After surgery updating traceability records; capturing causes of start-time deviations when present; enabling rapid readiness for subsequent sessions and brief feedback for iterative learning.

These activities are reported as context-dependent observations from a single-centre implementation phase and are not proposed as a formal professional standard.

The Da Vinci Coordinator clinical insights: minimum indicators

To contextualise this local experience, we report a small set of descriptive observations from the start-up phase (March–November 2025; 75 procedures). These elements are not intended as an assessment of effectiveness but solely to frame the coordination perspective discussed in this commentary

NSC ursing
2026, Volume 1, Nr. 5 pp 102-115

- *Instrument governance:* no episodes of instruments exceeding service life or requiring unplanned traceability checks.
- *Start-time predictability:* two delays of 15 minutes, both linked to lower scrub-nurse familiarity with robotic instrumentation.
- *Team coordination:* clearer role allocation, more reliable communication, faster instrument retrieval, and better adaptability to workflow changes.
- *Training:* three full days of standardized training for the dedicated robotic nursing team.

Together, these elements suggest that coordination activities may contribute to improving workflow stability during early implementation (Figure 2).

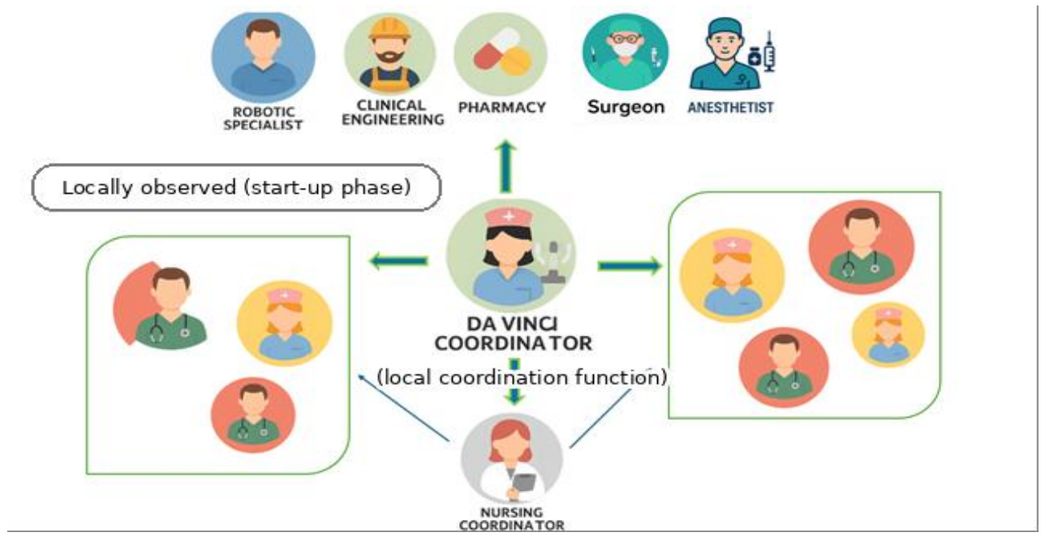

Figure 2. *Descriptive representation of coordination interfaces in our setting: not a codified organizational model*

Coordinating activities across perioperative phases (locally observed)

- Before surgery (preoperative / pre-session), the following activities should be undertaken:

verification of the planned robotic procedure requirements; confirmation of instrument availability, remaining usage-life/expiry, and updating of instrument traceability; coordination of instrument retrieval from multiple storage locations (operating room supply, pharmacy); confirmation of the patient positioning strategy and required positioning accessories; performance and/or coordination of system readiness checks (surgeon console, patient cart, vision cart); and alignment of timing, team roles, and setup responsibilities through a structured pre-session briefing and/or checklist.

- During surgery (setup, docking, intraoperative support), key responsibilities include: facilitation of real-time, bidirectional communication among surgical, anesthetic, nursing, and technical personnel; support of standardized setup and docking protocols; management of unanticipated requirements (e.g., rapid instrument retrieval, instrument substitutions, or workflow modifications); escalation and coordination of technical troubleshooting to minimize procedural interruptions; and support of rapid adaptation when novel techniques or intraoperative changes necessitate modifications in patient positioning or workflow organization.
- After surgery (post-session), the following measures should be completed: documentation of instrument utilization and corresponding updates to traceability records, including notation of any device- or process-related issues; recording of start-time deviations and their underlying causes, when applicable; planning and coordination of restocking for all consumed or opened materials to ensure readiness for subsequent procedures; and systematic capture of concise feedback and lessons learned to promote continuous quality improvement during the implementation and maturation of the robotic surgery program.

Taking care of the patient

The initial phase of robotic surgical is when the DVC collaborates with surgeons, anesthesiologists, and operating room nursing staff to conduct a comprehensive preoperative evaluation and

systematically coordinate the patient's subsequent surgical pathway [10]: reducing uncertainty, aligning roles, and preventing delays during the initiation phase of robotic surgery.[11]; As a Da Vinci Coordinator, taking care of the patient means ensuring safety, precision, and comfort at every stage of robotic surgery. This is managed through simple operational tools: a pre-session readiness checklist (system check, instrument availability/usage-life/expiry, positioning plan) [12], a short team briefing to align roles and timing, and an instrument traceability log updated at the end of each session; when issues are identified, they are communicated through structured alerts to the appropriate t contacts [13].

Future directions

Our experience suggests that a robotic surgery program can run better when there is a simple and clear way to coordinate the work. However, our data come from one center only (March–November 2025, 75 procedures), so we propose only realistic and small improvements.

Based on what we observed (instrument control, start-time delays, communication, and training needs), we suggest four practical directions:

1. Add coordination to routine session planning. Include the DVC in weekly or monthly planning of robotic sessions, instrument availability checks, and short pre-session readiness steps. Use simple checklists/logs to document key actions without creating extra bureaucracy.
2. Create training focused on start-up problems. Develop short training modules based on real issues seen during early use (instrument checks and traceability, standardized setup, communication during docking, and adaptation to new procedures). Test these modules locally or within regional networks.
3. Use basic digital tools to support instrument governance. Start with simple digital tracking (alerts for usage limits/expiry, replacement planning, and a basic delay log). Consider advanced

analytics after data collection becomes stable and reliable.

4. State the role clearly and define its limits. The DVC is not a ward/unit coordinator and does not manage staffing or overall department organization. The DVC is a procedure-focused coordination function, limited to the robotic pathway (pre-session preparation, setup support, instrument governance, communication, and training support). Clear boundaries help avoid overlap and confusion.

Overall, this commentary does not propose a standardized professional model. It offers a practical coordination perspective and a small set of process measures that other centers can use when starting a robotic program.

DISCUSSION

Our early implementation experience showed that the main sources of variability and delay were not related to the robotic technology itself, but to gaps in coordination and governance. Introducing a dedicated coordination function made these interdependencies visible and manageable across teams and phases. From this experience, three practical lessons emerged:

1. the need to define early "who does what" and establish clear instrument governance;
2. the value of brief, structured communication routines during setup;
3. the importance of training focused on the most frequent start-up challenges, including setup routines, instrument management, and communication during preparation and docking.

These observations are consistent with the literature showing that robotic implementation requires not only technological investment but also structured coordination, communication, and workflow standardisation [8, 11–13]. Reports on robotic nurse specialists or perioperative robotic coordinators

also suggest that responsibilities vary across centres and that no single standard model exists [8, 11–13]. Our commentary adds to this literature by offering a practical "coordination lens" for the start-up phase and a small set of feasible process indicators that can support reflection and future evaluation. Describing the DVC as a function (not a fixed job title) allows each hospital to adapt it to its own context and to choose a few simple measures to monitor progress.

Limitations

This commentary is based on a single-centre start-up experience and does not aim to demonstrate effectiveness. The indicators reported are minimal and primarily process-based, and several observations remain qualitative and may reflect local perceptions. Data were not collected through a predefined structured protocol, and the absence of a formal comparative evaluation limits interpretability. Findings may also be influenced by learning curves, case mix, and team experience or turnover. For these reasons, the DVC should be interpreted as a context-dependent coordination function intended to stimulate reflection rather than a validated or universally generalizable model.

CONCLUSION

Introducing robotic surgery requires not only technology and technical skills but also clear coordination work. Describing the DVC as a practical coordination function, rather than a fixed job title, allows each hospital to adapt it to its own organizational structure and to monitor a few simple process indicators to assess whether daily work is becoming more stable as the robotic program evolves.

Local Ethics Committee approval

Not applicable. This is a commentary reporting only aggregated, non-identifiable process information; no patient-level data were collected.

Conflict of interest

The authors report no conflict of interest.

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Authors' contribution

RC and MA were the only two contributors in writing the manuscript. RC and MA discussed the importance of the Da Vinci Coordinator role during a work meeting and decided to report and discuss this local coordination experience. Both authors contributed equally to the conception and writing of the manuscript.

NSC ursing 2026, Volume 1, Nr. 5 pp 102-115

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Nurse-led intervention on knowledge and awareness regarding chronic kidney disease among hypertensive and/or diabetic patients: A quasi-experimental study

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ABSTRACT

Background: Diabetes and hypertension are the leading causes of chronic kidney disease (CKD) worldwide, and adequate awareness is crucial for its prevention and early detection among high-risk populations.

Objective: To evaluate the effectiveness of a nurse-led educational program through a booklet on the awareness and knowledge of CKD among hypertensive and/or diabetic patients.

Methods: A pre-test and post-test control group design was used with a convenient sample of 90 patients, equally divided into the experimental and control groups, i.e., 45 in each. Awareness-knowledge was assessed using a validated self-structured questionnaire. The pretest was conducted in both groups, and the experimental group received a 25–30-minute education intervention. Post-test assessment was conducted after one month in both groups.

Results: The mean pre-test knowledge scores of patients in the experimental and control groups were 18.04± 6.47 and 17.42± 6.37, respectively. In the post-test, there was a significant increase in the knowledge score of patients in the experimental group (33.96± 4.59) compared to the control group (18.80± 5.55; p=0.001). Awareness of CKD was significantly associated with religion (p =0.016), monthly income (p = 0.02) and duration of diabetes (p value= 0.04). In regression analysis, being widow/separated and earning under 10,000 INR per month were independently associated to lower knowledge scores, while education beyond high school was an independent positive predictor.

Conclusion: Nurse-led educational programs effectively enhance CKD knowledge, support self-management, and help prevent disease-related complications among Hypertensive and/or diabetic patients.

Keywords: Chronic kidney disease, Diabetes, Hypertension, Knowledge, Nurse-led educational program.

NSC ursing 2026, Volume 1, Nr. 6 pp 116-136

INTRODUCTION

Chronic kidney disease (CKD) is an irreversible, progressive condition and a major global health burden, affecting nearly 1 in 10 individuals [1,2]. In 2017, CKD caused 1.2 million deaths, ranking as the 12th leading cause of death worldwide, with projections indicating it may rise to the 5th position by 2040 [3]. Alarmingly, about 90% of adults with CKD and 1 in 3 adults with severe CKD remain unaware of their condition, leading to delayed diagnosis and treatment and also increasing the burden on caregivers with a decrease in the quality of life of patients [4,5]. A systematic review reported that the prevalence of poor kidney function varies widely from 2.9% to 56% and confirmed CKD varied from 4.4% to 17.1% [6]. Risk factors differ across regions. In developed countries, ageing, diabetes, hypertension, cardiovascular diseases and obesity predominates, whereas in developing countries, infections, glomerular and tubulointerstitial diseases, and exposure to drugs and toxins are common causes [7–9]. Diabetes Mellitus (DM) and Hypertension (HTN) are the main causes of CKD worldwide [10–13].

Hypertension acts both as a risk factor by accelerating CKD progression and as a comorbidity contributing to cardiovascular mortality in CKD patients [12,14,15]. In India, a pilot study reported 70% of patients having advanced CKD stage 4-5, and Diabetes being the most common CKD, out of which 97% of cases were having type 2 diabetes [13,16]. Low awareness among high-risk populations contributes significantly to delayed diagnosis and poor outcomes [17–19]. Therefore, early risk stratification, screening, awareness, and education are essential strategies to slow CKD progression [20–22]. The studies have reported low awareness and knowledge regarding CKD among the high-risk population [17,23,24]. Global initiatives such as the National Health and Nutrition Examination Surveys and Kidney Early Evaluation Program for CKD emphasize early detection [25,26]. Health education combined with early screening empowers high-risk individuals to adopt healthy behaviors and effective self-management practices [25,27,28].

Objective

The objective of the study was to assess the awareness and knowledge of CKD among hypertensive and/or diabetic patients and to assess the effectiveness of an education booklet on knowledge of CKD among hypertensive and/or diabetic patients.

MATERIAL AND METHODS

The research hypothesised that a nurse-led education program would bring significant change in the knowledge of CKD among hypertensive and/or diabetic patients. The non-equivalent control group pre-post-test quasi-experimental design was employed for participants. The non-random, time-based allocation was adopted as a part of a quasi-experimental study design to minimise contamination between groups. Participants attending the cardiology OPD on Monday and endocrinology OPD on Tuesday were assigned to the control group, whereas those attending the cardiology OPD on Friday and endocrinology OPD on Thursday were assigned in experimental group. The data was collected from July 2018 to December 2018. A sample size of 44 was calculated in each group, based on the pilot study results. 90 patients were enrolled (45 per group), assuming a 90 % power, 5% alpha error, and 10% attrition. The pre-test was administered to the participants in both the control and the experimental group which required approximately 10-15 minutes to complete. Data collection included demographic and clinical variables. The awareness regarding CKD was assessed by asking two questions of a yes/no type. First question (AQ1) enquired whether the patients were aware of their risk of developing CKD due to HTN and DM or not. Second question (AQ2) enquired whether they were informed by any health professional or not. There were 43 questions regarding knowledge of CKD, out of which 35 were yes/no type, and 8 were multiple choice questions. Each correct response was scored as ‘1’, and each incorrect response was scored as ‘0’. Knowledge level was categorized into poor knowledge (<18), average knowledge (18-26), good knowledge (26-35), and very good knowledge (>35). Content Validity

NSC ursing 2026, Volume 1, Nr. 6 pp 116-136

was established by three nursing experts and two nephrologists. Reliability of the tools was assessed using the test-retest method (r=0.79) during pilot study on similar population. The tool was translated into Hindi, and reverse translation was done in English.

Inclusion Criteria

The participants aged above 18 years, diagnosed with HTN and/or DM for ≥ 6 months and visiting the cardiology and endocrinology outpatient department (OPD) for regular follow-up at a tertiary care hospital.

Exclusion Criteria

The participants with cognitive impairment and renal disease were excluded from the study.

Intervention

A registered nurse pursuing her postgraduate degree in nursing developed the education booklet under the guidance of study guides and experts.

The education booklet included information regarding kidneys, its functions, about CKD, its risk factors, signs and symptoms, preventive measures for diabetic and/or hypertensive patients, diagnostic investigation for CKD, its complications and the management**.** The education was given once to the participants of experimental group visiting the cardiology OPD (Friday) and endocrinology OPD (Thursday) for 25-30 minutes.

The post-test was carried out one month after the intervention in both the control and the experimental group. There was no loss to follow up and the data of all 45 participants in both groups were analysed.

Figure 1 illustrates the data collection process, including participant enrolment, group allocation to final analysis.

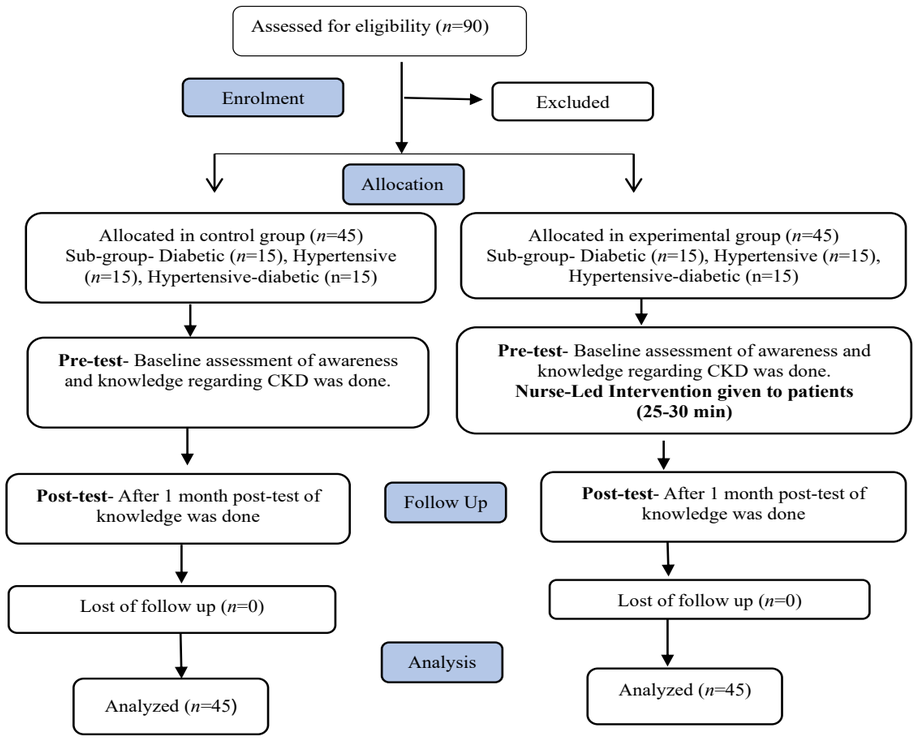

Figure 1. *Flowchart of participants.*

Local Ethics Committee approval and consent to participate

The study was approved by the institute's ethics committee for postgraduate research, AIIMS, New Delhi, Ref. No. IECPG-98/21.03.2018, and the study was approved on March 21, 2018. Eligible patients were informed, and written informed consent was taken; they were reassured of their confidentiality and autonomy. This study was conducted in accordance with the Declaration of Helsinki.

Statistical Analysis

STATA 14.0 was used for statistical analysis. The normal distribution of data was assessed using the

Shapiro-Wilk Test. The reliability of the tool was assessed using the test-retest method. The degree of stability over time was evaluated using Pearson's correlation coefficient (r), r > 0.7 was considered as a good correlation. Categorical variables were analysed using the Chi-square test and Fisher's exact test. Continuous variables following a normal distribution were analysed by the *t*-test; an unpaired t-test was used to compare the data between the control and experimental group, while a paired t-test was used to compare pre-test vs post-test data within the groups. The Wilcoxon rank-sum test was used to analyse data which was not distributed normally. Anova and Kruskal-Walli's rank test was used to assess the relationship of pre-test knowledge score with categorical variables, and Spearman's correlation coefficient was used to investigate the potential relationship between pre-test knowledge score with clinical variables. Univariable and stepwise multiple linear regression for calculating unadjusted and adjusted beta coefficients with 95% class interval were performed to find the independent association factors of knowledge. Categorical variables were included using dummy coding where one category serving as the reference group and assigned a value 0 like marital status (reference: unmarried), geographical region (reference: rural), educational level (reference: no formal education) and monthly income (reference: ≥40,000 INR) while the other categories converted into binary dummy variable (1 if present, 0 if absent). The level of significance was at p-value < 0.05.

RESULTS

The data were checked for homogeneity and were found comparable (p>0.05). Table 1 reports the demographic and clinical variable distribution of patients among the experimental and control groups. More than half (64 %) of patients in the experimental group and (67%) patients in the control group, were aware about the risk of developing kidney disease due to HTN and/or DM (AQ1) and only 42% in experimental group and 36 % in the control group got informed by any health care professional about their risk of developing CKD (AQ2).

Variables	Experimental Group (n=45)	Control Group (n=45)	*p*-value (test)
Age (years)			
Mean ± SD (Range)	51.71±13.71 (24-78)	51.84±11.51 (18-66)	0.96 (U)
	n (%)		
Gender			
Male	26 (58)	26 (58)	0.99 (C)
Female	19 (42)	19 (42)	
Marital status			
Unmarried	3 (7)	2 (4)	0.99 (F)
Married	42 (93)	39 (95.5)	
Occupation			
Government Job	10 (22)	7 (16)	
Private Job	20 (45)	21 (47)	0.7 (F)
Health Professional	1 (2)	0 (0)	
Unemployed	14 (31)	17 (38)	
Residence			
Rural	12 (27)	9 (20)	0.46 (C)
Urban	33 (73)	36 (80)	
Education			
Informal	10 (22)	10 (22)	
Primary	10 (22)	12 (27)	0.50 (C)
High school	12 (27)	16 (36)	
Above High school	13 (29)	7 (16)	
Source of health education			
Hospital	23 (51)	24 (53)	
Health Education	4 (9)	2 (4)	0.80 (F)
Program	18 (40)	19 (42)	
Other			
Monthly income (Rs.)			
>40,000	4 (9)	2 (4)	
30,000-40,000	10 (22)	8 (18)	
20,000-30,000	17 (38)	17 (38)	0.80 (F)
10,000-20,000	10 (22)	14 (31)	
<10,000	4 (9)	4 (9)	
Albuminuria §			
Nil	14(66.7)	15(65.2)	
Trace	3(14.3)	7(30.4)	0.22 (F)
>1	4(19.1)	1(4.4)	
Clinical Variables	**Median (Range)**		
Duration of diabetes	6.5(1-25)	7(1-30)	0.72 (W)
Duration of hypertension	6(1-25)	5.5(1-35)	0.74 (W)
Serum Creatinine(mg/dl)	0.9 (0.5-2)	0.8 (0.4-1.3)	0.02 (U)
GFR (1.73ml/min/m2)	86 (32-208)	94 (41-218)	0.12 (U)

Note: § Albuminuria report of only 21 patients in the experimental group and 23 patients in the control group was available. U (Unpaired T-test), C (Chi-Square Test), F (Fisher's Exact Test), W (Wilcoxon rank-sum Test)

Table 1. *Distribution of demographic and clinical variables of patients of the experimental and control groups*.

The knowledge level assessed at baseline showed that 44.4% patients in the experimental and 51.1% in control group had poor knowledge, 44.4% in the experimental and 37.7% in the control

group had average knowledge, 9% patients in the experimental and 11% in the control group had good knowledge; however, only 2.2% patients in the experimental group had very good knowledge, and none in the control group had very good knowledge. Table 2 showed that at baseline, both groups were similar in knowledge level and the nurse-led education program was effective in improving knowledge of CKD among hypertensive and/or diabetic patients.

Groups	Pre-test Score Mean± SD (Min-Max)	Post-test Score Mean± SD (Min-Max)	*p*-value (test)
Experimental group (n=45)	18.04 ± 6.47 (4-35)	33.96 ± 4.59 (21-43)	0.001* (P)
Control group (n=45)	17.42 ± 6.37 (3-27)	18.80 ± 5.55 (9-30)	0.0018* (P)
p-value	0.65 (U)	0.001* (U)	

Note*:* * (significant test), U (Unpaired T-test), P (Paired T-test).

Table 2. *Comparison between the knowledge score of the experimental and control groups*

Table 3 shows that after the nurse-led educational program, in the post-test, the experimental groups showed a greater improvement in knowledge scores (diabetics p = 0.001, hypertensives p = 0.001, and hypertensive-diabetics p = 0.001) compared to the control group (diabetics p = 0.17, hypertensives p = 0.12, and hypertensive-diabetics p = 0.10), further emphasizing the effectiveness of the intervention even at the subgroup level.

Knowledge score		Experimental group (n=45)	Control group (n=45)
Diabetic (n=15)	Pre-test score	17.40±4.50	16.66±5.99
	Post-test score	33.80±2.95	18.13±4.43
p-value (test)		0.001* (P)	0.17 (P)
Hypertensive (n=15)	Pre-test score	18.66±6.87	16.93±7.45
	Post-test score	34.20±5.64	17.93±6.09
p-value (test)		0.001* (P)	0.12 (P)
Diabetic and hypertensive (n=15)	Pre-test score	18.06±7.95	18.66±5.77
	Post-test score	33.86±5.06	20.33±5.99
p-value (test)		0.001* (P)	0.10 (P)

Note*:* * (significant test), P (Paired T-test).

Table 3. *Comparison of knowledge score between sub-groups of experimental and control group.*

Table 4 reported the relationship between awareness and demographic variables. Patients with a higher monthly income (p = 0.02), hindu by religion (p = 0.01), showed greater awareness of the risk of chronic kidney disease.

Variables		AQ1			AQ2		
		NO n(%)	YES n(%)	p-value (test)	NO n(%)	YES n(%)	p-value (test)
Age(years)	Mean ± SD	55.35±12.38	49.89±12.39	0.05(U)	53.40±12.56	49.22±12.39	0.12(U)
Gender	Male	20 (64.5)	32 (54.2)	0.37(F)	32 (58.2)	20 (57.1)	0.96 (F)
	Female	11 (35.5)	27 (45.8)		23 (41.8)	15 (42.9)	
Religion	Hindu	29(93.6)	46 (78)	0.01* (F)	47 (85.5)	28 (80)	0.39(F)
	Muslim	0 (0)	10 (17)		4 (7.3)	6 (17.1)	
	Sikh	2 (6.4)	1(1.7)		2 (3.6)	1 (33.3)	
	Christian	0 (0)	2(3.4)		2 (3.6)	0 (0)	
Marital status	Unmarried	1 (3.2)	4 (12.9)	0.40(F)	3 (5.4)	2 (5.7)	0.99(F)
	Married	25 (80.6)	51 (86.4)		46 (83.6)	30 (85.7)	
	Widow/widowed	1 (3.2)	0 (0)		1 (1.8)	0 (0)	
	Separated	4 (12.9)	4 (12.9)		5 (9.1)	3 (8.6)	
Occupation	Government Job	6 (19.4)	11(18.6)	0.80(F)	12 (21.8)	5 (14.3)	0.42(F)
	Private Job	16(51.6)	25 (42.4)		26 (47.3)	15 (42.9)	
	Health Professional	0 (0)	1 (1.7)		0 (0)	1 (2.9)	
	Unemployed	9 (29.0)	22 (37.3)		17 (30.9)	14 (40)	
Geographical region	Urban	8 (25.8)	13 (22)	0.68(C)	14 (25.5)	7 (20)	0.55(C)
	Rural	23 (74.2)	46 (78)		41 (74.5)	28 (80)	
Education	Informal Education	9 (29.0)	11 (35.5)	0.07(F)	12 (21.8)	8 (22.9)	0.52(F)
	Primary Education	11(35.5)	11(35.5)		13 (23.6)	9 (25.7)	
	High school	5 (16.1)	23 (39)		15(27.27)	13 (37.1)	
	>High school	6 (19.4)	14 (23.7)		15(27.27)	5 (14.3)	
Source of health education	Hospital	17 (54.8)	30 (50.9)	0.93(F)	26(47.27)	21 (60)	0.31(F)
	Health Edu. Prog.	2 (6.5)	4 (6.8)		3(5.45)	3 (8.6)	
	Other (specify)	12 (38.7)	25 (42.4)		26(47.27)	11(31.4)	
Monthly income(Rs.)	>40,000	1 (3.2)	5 (8.5)	0.02*(F)	1(1.82)	5 (14.3)	0.05(F)
	30,000-40,000	5 (16.1)	13 (22.0)		12(21.82)	6 (17.1)	
	20,000-30,000	10 (32.3)	24 (40.7)		18(32.73)	16 (45.7)	
	10,000-20,000	8 (25.8)	16 (27.1)		17(30.91)	7 (20)	
	<10,000	7 (22.6)	1 (1.7)		7(12.73)	1 (2.9)	

Note: * (significant test), (U) t-test, (C) Chi square, (F) generalised Fisher's Exact Test, (W) Wilcoxon test.

Table 4. *Relationship between Awareness and Demographic Variables*.

Table 5 reported the relationship between awareness and clinical variables and found that patients having diabetes for a longer period of time had higher awareness of CKD risk (p=0.04).

Clinical Variables		AQ1			AQ2		
		NO	YES	p-value	NO	YES	p-value (test)
Duration of diabetes (Median)		4	8.5	0.04*(W)	5.5	9.5	0.06(W)
Duration of hypertension (Median)		6	6	0.38(W)	6	5	0.74(W)
Albuminuria	Nil	12	17	0.18 (F)	19	10	0.46 (F)
	Trace	1	9		5	5	
	>1	1	4		2	3	
Serum Creatinine(mg/dl)		0.9	0.8	0.13(W)	0.87	0.9	0.64(W)
GFR (1.73ml/min/m2)		86	95	0.18(U)			0.90(U)

Note: * (significant test), U (Unpaired t-test), C (Chi-square), F (generalised Fisher's Exact Test), W (Wilcoxon test).

Table 5. *Relationship between Awareness and Clinical Variables*

Table 6 showed the relationships between demographic variables and knowledge score. Patients living in urban areas (p=0.03), unmarried (p=0.008), with more than high school education (p=0.0008), and a monthly income of 30-40 thousand rupees (p=0.01) had higher knowledge than others.

Demographic Variables	Knowledge Score (Mean ± SD)	p-value (test)
Gender		
Male	17.76 ± 6.83	0.95 (U)
Female	17.68 ± 5.82	
Religion		
Hindu	17.45 ± 6.65	0.35 (U)
Muslim	19.13 ± 4.82	
Marital status		
Unmarried	24.60 ± 3.20	0.008* (K)
Married	17.76 ± 6.15	
Widow/widowed/Separated	13.66 ± 6.83	
Occupation		
Government Job/Health Professional	19.44 ± 8.51	0.38 (A)
Private Job	17.68 ± 6.02	
Unemployed	16.80 ± 5.39	
Geographical region		
Rural	15.09 ± 6.96	0.03* (U)
Urban	18.53 ± 6.03	
Education		
Informal Education	13.90 ± 4.96	0.0008* (A)
Primary Education	16.18 ± 5.43	
High school	19.32 ± 5.35	

>High school	21.05 ± 7.74	
Source of health education		
Hospital	17.10 ± 6.68	
Health Edu. Prog.	21.66 ± 5.04	0.23 (K)
Other (specify)	17.89 ± 6.10	
Monthly income (INR)		
>40,000	19.67 ± 9.69	
30,000-40,000	20.77 ± 6.50	
20,000-30,000	17.20 ± 5.79	0.01* (K)
10,000-20,000	17.79 ± 5.04	
<10,000	11.50 ± 5.90	
Albuminuria		
Nil	17.10 ± 4.95	
Trace	19.50 ± 4.57	0.47 (K)
> +1	19.20 ± 9.17	

Note: * (significant test), U (Unpaired T-test), A (Anova), K (Kruskal-Wallis rank test).

Table 6. *Relationship of pre-test knowledge score with selected variables.*

In Table 7, no correlation was found between knowledge and clinical variables (age, duration of diabetes, duration of hypertension, serum creatinine(mg/dl), and GFR (1.73ml/min/m2).

Clinical Variables	Spearman's Coefficient (rho)	p-value (test)
knowledge / Age	-0.165	0.12 (S)
knowledge / Duration of diabetes	0.049	0.70 (S)
knowledge / Duration of hypertension	0.002	0.99 (S)
knowledge / Serum Creatinine(mg/dl)	-0.067	0.52 (S)
knowledge / GFR (1.73ml/min/m2)	0.08	0.41 (S)

Table 7. *Correlation analysis between Knowledge score and Clinical Variables.*

In Table 8, the variables that were statistically significant in bivariate analysis (Table 6) were included in univariable and multiple linear regression analysis. In the adjusted stepwise multiple linear regression model, being widowed/separated and having a monthly income of less than 10,000 INR remained independently associated with lower knowledge scores, while education beyond high school emerged as an independent positive predictor. Other variables did not retain statistical significance after adjustment. The results were interpreted as the knowledge among widowed/separated patients was less as compared to unmarried patients.

NSC ursing
2026, Volume 1, Nr. 6 pp 116-136

Variables	Unadjusted beta coefficient with 95% CI	*p*-value	Step-wise linear regression	*p*-value
Marital status				
Married	-6.83 (-12.4, -1.2)	0.018	-5.11 (-10.2, 0.04)	0.05
Widow/widowed/Separated	-10.93 (-17.7, -4.2)	0.002	-7.90 (-14.2, -1.6)	0.015
Residence				
Urban	3.44 (0.3, 6.5)	0.03	———	———
Education				
Primary	2.28 (-1.3, 5.9)	0.21	1.93 (-1.5, 5.4)	0.26
High school	5.42 (1.9, 8.8)	0.002	4.48 (1.2, 7.8)	0.008
>High school	7.15 (3.4, 10.8)	0.001	6.06 (2.5, 9.6)	0.001
Monthly income				
30,000-40,000	1.11 (-4.5, 6.7)	0.69	-0.44 (-5.6, 4.7)	0.86
20,000-30,000	-2.46 (-7.8, 2.8)	0.36	-3.06 (-7.9, 1.8)	0.21
10,000-20,000	-1.87 (-7.3, 3.6)	0.50	-2.20 (-7.2, 2.8)	0.38
<10,000	-8.16 (-14.6, -1.6)	0.01	-7.79 (-13.7, -1.8)	0.011

Table 8. *Regression analysis of knowledge with selected variables.*

A significant increase in knowledge was found in patients who had education up to high school and beyond high school, respectively, as compared to patients who had informal education. There was a significant decrease in knowledge score in patients who had a monthly income of less than 10,000 rupees compared to patients who had monthly income more than 40,000 rupees.

DISCUSSION

In the present study, 65.5% were aware of the risk of kidney disease in hypertensive and/or diabetic patients. Similarly, 60.6% respondents recognised diabetes as a risk factor for renal disease [29]. In the present study, 44.4% in the experimental and 51.1% in the control group had poor knowledge, 44.4% in the experimental and 37.7 in the control had average knowledge, 9% in experimental and 11.1% in control group had good knowledge, 2.2% in experimental and none in control had very good knowledge. Nearly the same, 55% of participants had average knowledge regarding renal disease [30]. In our study the knowledge score was significantly improved pre-test 18.04 ± 6.47 to post-test 33.96±4.59 at p=0.001in the experimental group similarly there was significant increase in knowledge of CKD was reported ($p < 0.05$) [31,32]. Knowledge was higher in unmarried subjects, living in an urban region, having an education up to or more than high school, and having a monthly

income of more than 30,000 rupees. Similarly, patients with higher education had more knowledge of renal disease than those patients who had lower education (p=0.001) [10,24,34]. Patients having lower income <$ 2000 [Odds ratio (*OR*) 0.41, 95% class interval (CI)] and lower education (*OR* 0.33. 95% CI) had poor knowledge score of CKD [30,35].

The post-test was taken after one month of the intervention, rather than immediately, which could affect the novelty effect, causing a threat to external validity and no attrition at follow-up was a strength of the study.

Limitations

Awareness was assessed using two questions and most items in the knowledge questionnaire were closed-ended in nature and may overestimate the knowledge or limit the critical ability of critical reasoning related to kidney health.

The study didn't evaluate the gain translated into sustained behavioural changes, treatment adherence, or improved clinical outcome. Additionally, the single-centre, quasi-experimental design with convenient sampling and lack of randomization may impact the external validity, limit the causal inference and generalizability

CONCLUSION

In conclusion, the nurse-led intervention significantly improved the CKD knowledge score among hypertensive and/or diabetic patients. Appropriate information empowers hypertensive and/or diabetic patients to manage better blood pressure, blood sugar, and lifestyle changes, potentially reducing the risk and progression of kidney disease. Multicentric studies are needed, along with structured nurse-led education and counselling programs for these patients, and longitudinal research to comprehensively evaluate kidney health maintenance.

NSC ursing 2026, Volume 1, Nr. 6 pp 116-136

List of abbreviations

CKD: Chronic Kidney Disease

HTN: Hypertension

DM: Diabetes Mellitus

OPD: Outpatient Department

AQ1: Awareness Question 1

AQ2: Awareness Question 2

AIIMS: All India Institute of Medical Sciences

IECPG: Institute Ethics Committee for Postgraduate

STATA: Statistics and Data Analysis software

GFR: Glomerular Filtration Rate

OR: Odds Ratio

CI: Class Interval

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Conflicts of interest

The authors declare that there is no conflict of interest.

Author contributions

Conceptualisation: JJ, MAKR, RN, VPJ, methodology: JJ, MAKR, RN, VPJ, Software: JJ, Data Collection: JJ, MAKR, RN, VPJ, Data analysis and interpretation: JJ, MAKR, writing- original draft preparation: JJ, MAKR, writing-review and editing: JJ, MAKR, supervision: MAKR, RN, VPN

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Knowledge and Attitudes of the Role of Artificial Intelligence in Healthcare among Undergraduate Nursing Students in the Northeast of Pakistan: A Descriptive Cross-Sectional Study

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ABSTRACT

Background: Artificial intelligence (AI) is progressively developing as a breakthrough in healthcare provision, improving clinical decision-making, patient safety, and efficiency. Nursing students must be sufficiently equipped to comprehend and exploit AI technologies as future healthcare specialists. Nevertheless, there is a lack of local data regarding the knowledge of the nursing students and their attitude to AI in healthcare in Pakistan.

Objective: This research evaluated the knowledge and attitude of undergraduate nursing students about artificial intelligence (AI) in healthcare in colleges of Northeast of Pakistan.

Methods: An in-depth survey was used to conduct a descriptive cross-sectional study among undergraduate Generic Bachelor of Science in Nursing (BScN) students of 11 nursing colleges located in Mardan Northeast of Pakistan over a period of four weeks. The method of sampling was the non-probability convenience sampling method. The sample size was determined using 95 percent of the confidence of a 5 percent margin of error in Open Epi. The participants (n=310) have been used to collect data using a structured and validated 2-rule questionnaire which included knowledge (10 questions) and attitude (10 questions) towards artificial intelligence in health care. The data analysis was carried out using descriptive analysis of frequencies, means, and standard deviations.

Results: Nursing students exhibit substantial knowledge regarding the issue of artificial intelligence. (mean knowledge score 4.02 +- 0.58). Most of the respondents agreed that AI had some beneficial use in the healthcare industry and could improve nursing practice and as such should feature in nursing learning. The overall attitude toward artificial intelligence was good as the mean score of the attitude was 3.72±0.48. The majority of the students viewed AI as useful in terms of patients and healthcare progress. Nevertheless, the problems concerning ethical concerns, privacy, legal duty, and job substitution were also communicated.

Conclusion: Undergraduates nursing students at Mardan, Northeast of Pakistan possess favorable

experiences and understand the artificially intelligent healthcare knowledge comprehensively. Despite positive perceptions, current challenges suggest that systematic education, ethics counseling, and curriculum alignment regarding AI that will equip future nurses with suitable approaches to experienced artificial intelligence, which is safe and effective.

Keywords: Knowledge, Artificial Intelligence, Attitude, Nursing Students, Healthcare, Pakistan.

INTRODUCTION

Artificial intelligence (AI) is quickly revolutionizing the healthcare field, and it requires a proper comprehension of its place among upcoming healthcare practitioners, especially among undergraduate nursing students [1]. It is essential to assess the level of knowledge and the attitude of these students towards being able to successfully integrate into clinical practice and education [2,3]. The literature has constantly demonstrated that although nursing students tend to acknowledge the potential of AI, the gaps in their knowledge and diverse attitudes tend to be numerous to be met with through the effective development of the curriculum and proper use of AI technologies [4-7].

The introduction of AI to nursing education implies the evaluation of the knowledge of students regarding AI applications, its advantages, challenges, and ethical issues [7]. On the one hand, AI in the medical sector refers to a broad range of applications, such as improving the clinical decision-making process, streamlining hospital processes, and augmenting patient care and monitoring [8]. As an example, AI algorithms have the capacity to process large amounts of patient data and offer evidence-based suggestions, enhance personalized medicine by designing treatment plans to specific patients, and make an accurate diagnosis in such areas as radiology and pathology [9,10] and [11]. The optimization of logistics, the automation of administrative processes, and a better flow of patients and schedule are other examples of AI-based contributions to the hospital

NSC Nursing 2026, Volume 1, Nr. 7 pp 137-171

management [12]. AI-powered wearable gadgets and virtual nursing assistants help tremendously in remote care and patient monitoring by continually tracking vital data and offering assistance [13].

Even though these advantages have been identified, a major percentage of nursing students have little awareness of particular AI applications and their principles [14,15]. Indicatively, a recent study carried out in Pakistan revealed that the undergraduate nursing students were not equally aware of AI and its impact on healthcare, which is why educational interventions tailored to this population should be provided. In another study conducted in western China, students were positive about generative AI, but their actual usage and their level of such knowledge demonstrated that the curriculum should be optimized [16]. Such lack of knowledge is possible because of insufficient exposure to the concept of AI in their courses and a general unawareness regarding its widespread use in healthcare systems of the modern era [17,18].

The perception of AI in nursing students is multiple, as it may tend to be both positive and negative [19,20]. A large number of students admit that AI has the ability to enhance patient outcomes, make better decisions, and simplify work processes [21,17]. As an illustration, nursing students in Saudi Arabia tended to be positive and willing to use AI technology, and they understood that the technology had the potential to revolutionize medical practice [18]. Likewise, the Turkish research found that nursing students had a positive attitude to AI and saw its potential in future practice [9]. Such optimism is typically fueled by the fact that AI may result in the more efficient and effective care of patients [10].

Nevertheless, this interest is commonly restrained by such factors as consideration of ethical aspects, job loss, and must-have training [11]. Students report that they are afraid of the possibility of AI taking over human jobs in nursing, ethical issues related to patient privacy and data security, and the need to acquire additional skills in digital literacy to adjust to high-technology healthcare settings [14]. An example of a study conducted among nursing students in Jordan examined the relationship between AI ethical awareness, attitudes, anxiety, and the intention to use AI technology,

which showed that ethical considerations played an important role in their views [21]. In addition to that, the psychological consequences of AI implementation, such as possible distress and self-efficacy issues, were observed among nursing students [20].

To overcome these obstacles, curricula should be structured in a way to increase the AI literacy of nursing students and develop positive attitudes [15]. This will include the integration of AI-specific material into the nursing curriculum, practical preparation, and the promotion of the (collaborative) character of interaction between humans and AI instead of emphasizing its replacement [21]. Project-based learning is one of the interactive forms of learning, which could considerably increase the knowledge and confidence of students in the use of AI tools [20]. These methods assist students in overcoming the initial knowledge gaps, learning to cooperate, and stimulating the development of scientific research [15]. The experience of undergraduate nursing students working on an AI-based project is based on an emotional process. At the initial stage, they are disadvantaged by their lack of knowledge. During the adaptation stage, they are influenced by external factors that guide them toward self-fulfillment. At the completion of the project, they will have clear expectations and recommendations of their own. [16]. First, students might be confused, feel unfamiliar, and embarrassed because of the lack of knowledge and abilities, along with the excitement about challenging new things [17]. Through adaptation, cooperation ability, classroom participation satisfaction, and the central role played by the teachers and teaching assistants continue to improve in the growth of the individual [18]. Lastly, learners share their wants to continue learning deeper, provide feedback on how to improve their abilities, and provide recommendations on the way to teach them better [18].

Moreover, it is crucial to deal with possible biasness of the AI models and provide ethical governance. In healthcare, AI should be able to guarantee patient privacy, data safety, and transparent functionality to develop trust [19]. The idea of such a phenomenon as data provenance serves as the reminder of the fact that the quality and history of data utilized to train AI models

directly affects its accuracy and safety. To make AI systems accurate, reliable, and safe, rigorous validation procedures are commonly required that include testing algorithms on massive datasets to avoid biases and provide interpretable and useful systems [20]. To conclude, although undergraduate nursing students are likely to be aware of the increasing role of AI in the healthcare sector, their levels of knowledge and attitudes can be both high and low. It is evident that more comprehensive and interdisciplinary education techniques are required to not only increase AI literacy but deal with ethical issues, alleviate anxiety, and equip them to effectively apply AI into clinical practice in the future [21]

Aim

The purpose of the proposed study is to determine the extent of knowledge and perception regarding the use of artificial intelligence (AI) in nursing among undergraduate nursing students in Mardan, Northeast of Pakistan.

Objectives

1. To identify how much the undergraduate nursing students know about artificial intelligence and its application in healthcare.
2. To identify the influence of the undergraduate nursing students on the application of artificial intelligence in healthcare practice.
3. To ascertain the perceived benefits and concerns related to the introduction of artificial intelligence in the healthcare industry among nursing students.
4. To examine the relationship between the degree of knowledge and the attitude to use artificial intelligence in healthcare.
5. To formulate the influence of demographic and educational factors (year of study, prior experience with AI, and training) on the knowledge and attitudes of students.

6. To generate evidence likely to support the introduction of the study of artificial intelligence in the undergraduate nursing programs in Mardan, Northeast of Pakistan.

MATERIALS AND METHODS

Study Design and Setting

It is a descriptive cross-sectional study done on the nursing colleges in Mardan, Northeast of Pakistan, over a span of four weeks. The study was based on the aim of assessing the levels of knowledge and attitudes of the undergraduate nursing students concerning the use of artificial intelligence (AI) in healthcare.

Study Population

The research sample consisted of undergraduate students pursuing the Bachelor of Science in Nursing (BScN) at selected nursing institutions in Mardan, Northeast of Pakistan. The post-RN BScN and the diploma nursing students were omitted to ensure that the academics are exposed and trained in a uniform manner.

Sample Size and Sampling Method

The present study was a descriptive cross-sectional study to determine the degree of knowledge and attitude towards artificial intelligence (AI) in healthcare among undergraduate nursing students. Any information that was to be determined or computed to calculate the required sample size was done by the means of the open-source epidemiological statistics calculator known as OpenEpi version 3.

Cochran's sample size formula was used to compute the initial sample size of an infinite population (n_0) as follows:

$$n_0 = \frac{Z^2 p(1-p)}{d^2} = \frac{Z^2 pq}{d^2} = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2} = 384$$

where: n_0 is the estimate sample size (infinite population), p represents the estimated proportion of the population possessing the characteristic of interest, while q is its complement (q = 1 – p). Since no prior estimate was available, we used $p = 0.5$ and $q = 0.5$, which provide the maximum variability and therefore the most conservative sample size. Z is the Z-score at 95% confidence level equal to 1.96, and d is the margin of error set to 0.05.

Since the study population, which is 1,567 undergraduate Generic BSN students in Mardan district is finite (total population N = 1,567), the finite population correction (FPC) formula was used to calculate the adjusted sample size (n):

$$n = \frac{n_0}{\left(1 + \frac{n_0 - 1}{N}\right)} = \frac{384}{\left(1 + \frac{384 - 1}{1{,}567}\right)} = 309$$

where: n is final adjusted estimate sample size and N is the total population size (1,567). Hence, 309 students were the minimum sample required.

In order to reduce non-response bias and missing questionnaires, all eligible and accessible undergraduate BSN students were contacted to take part. The number of students that answered the survey reached 310, which is sufficiently to justify the statistical sufficiency of the research.

Sampling Details

The non-probability convenience sampling technique was used based on practicality such as availability of the respondents, time factor and the research was exploratory.

Recruitment of Students

The sampling technique involved students who were selected in nursing colleges in Mardan, Northeast of Pakistan that provided administrative support to the research. The process of recruitment was organized with the help of the faculty coordinators and class representatives, who sent all eligible students the survey link using official academic communication tools, such as WhatsApp groups, institutional email lists, and academic forums.

Contexts of Participation

Participation was mainly through online medium (Google Forms), through which the students could use their own time to fill the questionnaire. Also, there was information exchange on the study in the classroom and laboratory time when the faculty briefly described the purpose and procedures without imposing pressure on students to take part.

Voluntary Participation

The involvement was voluntary. Detailed information on the study including objectives of the study, procedures and the possible benefits was given to the students. They had signed the informed consent electronically before they could gain access to the questionnaire. Students were promised that either way of involvement (or non-involvement) would not in any way interfere with their academic assessment. The management of self-selection bias involves selecting cases evenly: the proportion of male to female cases will be equal.

Although convenience sampling carries a risk of self-selection bias, several measures were employed to minimize this possibility. The offer to participate was sent to all eligible students without any regard to previous interest or knowledge on AI. There were several reminders to help the students who may have otherwise chosen not to take part in the study, which increased the sample representativeness. The fact that the participants are represented by various colleges in the

Mardan district makes the study less prone to bias and more reliable in the findings.

Eligibility Criteria

Only the students who are currently pursuing the Generic BSN program were eligible to get included. Students of post-RN and diploma nurses were not included to make sure that the exposure and training were similar in academics. Students who refused to take part or even filled out the questionnaires were also not included in final analysis.

The convenience sampling can reduce the level of generalizability, but in this case of studying the institution on an exploratory basis, it was considered suitable. The success of having a sample that is equal and slightly greater than the required size and the inclusion of students representing various institutions increases the representativeness and the validity of the study results.

Data Collection Tool

Data collection was done through the structured and standardized questionnaire, which was based on the already published and verified studies of knowledge and attitudes toward artificial intelligence in healthcare [9]. Little local contextual modifications were made to fit the local academic context without tampering with the original validity of the content. The original tools were obtained, and the authors were approached and allowed to use the tool.

The questionnaire was separated into two:

- Part I: Assessment of the application of artificial intelligence in healthcare (10 multiple choices)
- Part II: Attitude about artificial intelligence application in healthcare (10 multiple choices).

All the items were dedicated to the main topics, applications, benefits, and concerns of artificial

intelligence in health care facilities.

Data Collection Procedure

The questionnaire was created based on the survey translated into a questionnaire and posted online through the Google Forms platform and sent to the respondents through mobile applications. The participation had been done with informed consent that had been informed in the electronic form. The research was a voluntary one, and the respondents were free to abandon the research at any given time.

Ethical Considerations

The Institutional Review Board (IRB) approved of the study ethically. The participants were assured that their information, privacy, and anonymity were assured. They were informed that they were taking part in the research work voluntarily, and they could withdraw at any stage without any academic and personal consequences.

Statistical Analysis

The data were analyzed using SPSS version 26. All the variables were calculated to obtain the descriptive statistics. On the continuous variables (age, knowledge scores, attitude scores), we have computed mean, standard deviation (SD), median, interquartile range (IQR), minimum and maximum. Frequencies and percentages were used to present categorical variables (gender, year of study, college name). We checked the normal distribution of knowledge and attitude scores with the help of the Shapiro-Wilk test The Shapiro-Wilk p-value of both scores were greater than 0.05, which proves a normal distribution and meets the conditions of parametric tests.

The correlation coefficient employed to analyze the relationship between attitude scores and total knowledge scores was Pearson correlation coefficient. Linearity and the assumption of approximate

normality were verified and met.

Mean knowledge and attitude scores between male and female students were compared using independent samples t-test.

The one-way ANOVA was applied to analyze the data concerning the difference in the mean scores of knowledge and the attitude among four academic years. The choice of this test was due to the availability of the independent variable (academic year) with more than two levels. We checked the assumptions of homogeneity of variances and normality prior to the execution of the test. The Shapiro-Wilk test was used to determine normality and gave non-significant ($p > 0.05$) values in all the year groups, which indicated normally distributed data. The homogeneity of variances was tested with the Levene, which did not have a significant value ($p > 0.05$), and it proved that there were similar variances in groups. In the instances of overall ANOVA significance, post-hoc pairwise comparisons to control Type I error were then done using Tukey Honestly Significant Difference (HSD) test. The attitude scores were predicted using simple linear regression analysis and knowledge as the predictor variable. Independent predictors of attitudinal scores were examined using multiple linear regression, with the covariates of the model being knowledge score, year of study, and gender. The enter method was used to input all the predictors at the same time. In the two regression analyses, the conditions of linearity, independence of residues, homoscedasticity and normality of residues were tested. These conditions were satisfactorily achieved. Correlation and regression coefficients confidence intervals (95%) were also reported to estimate the precision.

The p-value (p) statistically significant was determined to be less than 0.05 and all p-values were two-tailed.

RESULTS

Demographic Characteristics of the participants.

In this study, 310 undergraduate nursing students were involved in the study who were selected in

the nursing colleges of Mardan. The average age of the participants was 20.56 (SD = 1.47) years with ages of 18-28 years (Table 1).

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	17	5	1.6
	19	97	31.3
	20	53	17.1
	21	64	20.6
	22	72	23.2
	23	10	3.2
	24	6	1.9
	25	2	0.6
	28	1	0.3
Gender	Male	257	83
	Female	53	17.1
Year of Study	1st Year	25	8
	2nd Year	138	44
	3rd Year	100	31
	4th Year	48	15
College Name	Matonia College of Nursing	50	16
	Elizabeth Rani College of Nursing	46	15
	BKMC College of Nursing, Mardan	41	13.2
	Institute of Health Sciences	39	12.6
	Government College of Nursing, Mardan	32	10.3
	Oriental College of Nursing, Mardan	31	10.0
	Alfajar College of Nursing	27	8.7
	TPIHS	23	7.4
	Mardan Institute of Nursing	11	3.5
	Zia College of Nursing	7	2.3
	Kingsway Institute	3	1.0

Table 1. *Demographic Characteristics (N=310)*

When it comes to gender distribution, most of the respondents were men (82.9%), and 17.1% were women. Regarding the academic year, the majority of students were taking the second year (44.5%), the third year (32.3%), the fourth year (15.2%), and the first year (8.1%). Students who were undertaking the BSN program were invited to take part in the research. The Students Participate from these 11 different nursing colleges within the district of Mardan. Matonia College of Nursing (16.1%), Elizabeth Rani College of Nursing (14.8%), BKMC College of Nursing, Mardan (13.2%), Institute of Health Sciences (12.6%), and Government College of Nursing, Mardan (10.3%) made the highest percentage proportion of the students. The rest were participants

NSC Nursing
2026, Volume 1, Nr. 7 pp 137-171

of the Oriental College of Nursing (10.0%), Alfajar College of Nursing (8.7%), TPIHS (7.4%), Mardan Institute of Nursing (3.5%), Zia College of Nursing (2.3%), and Kingsway Institute (1.0%). This sample is a wide representation of Mardan undergraduate nursing students.

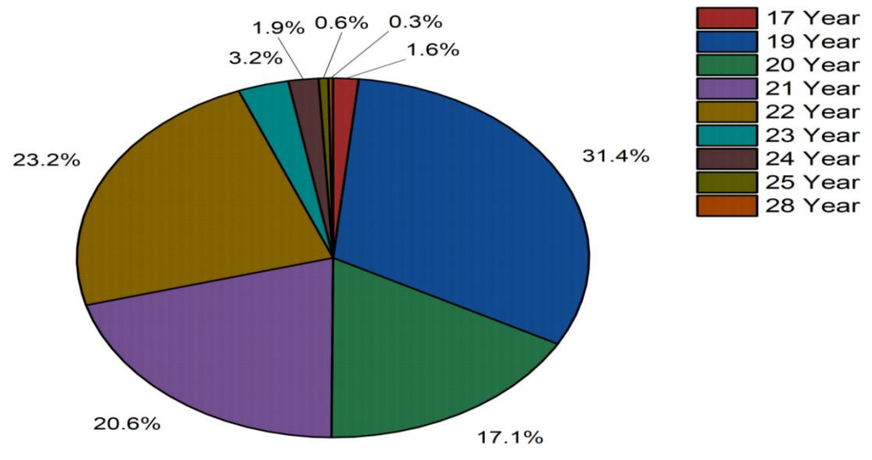

Figure 1. *Age of nursing students (N=310)*

The Figure 1 shows the age distribution of 310 nursing students of college going in Northeast Pakistan in the age range between 17 to 28. The number of students who fall within the range of 19 to 22 years is 92 percent. The highest percentage is 19 -year-olds (31.3) and 22-year-olds (23.2) and 20-year-olds (17.1). Ages of 23, 24, 17, 25 and 28 are included in smaller groups. The average age is 20.6 years which is normal among undergraduates in the area.

Figure 2 illustrates the enrollment of four years of BScN program. The highest number is of the second-year students (44.5%), third (32.3%), fourth (15.5%), and first-year students (8.1%). Sixty-seven percent of the respondents are in the second and third year, and this provides a balanced picture of the education levels.

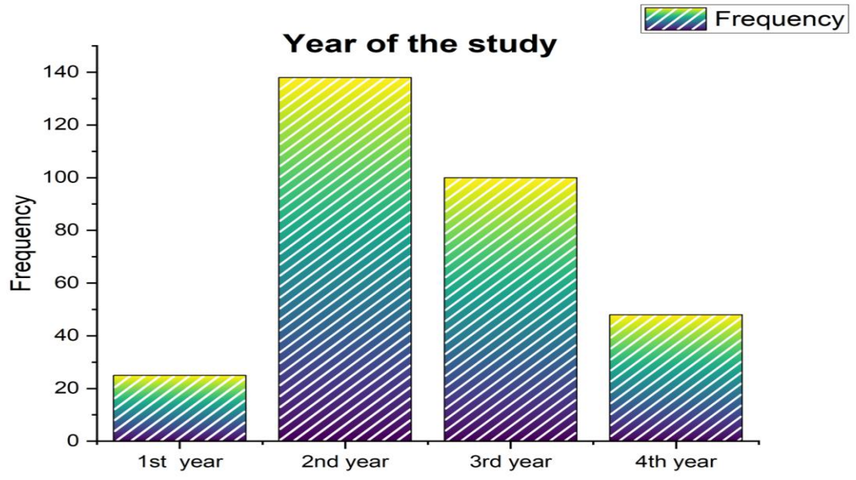

Figure 2. *Students' year of study (N=310)*

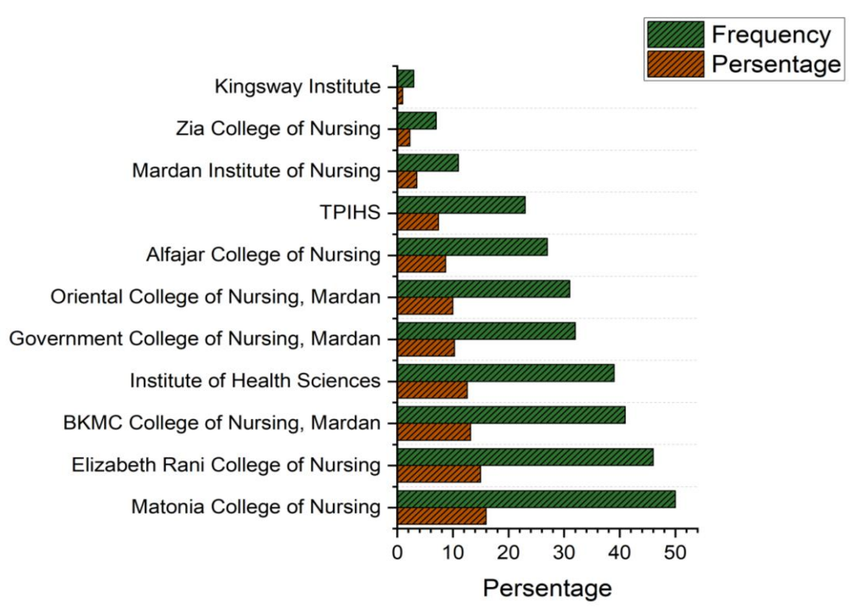

Figure 3. *Names of Colleges (N=310)*

NSC Nursing
2026, Volume 1, Nr. 7 pp 137-171

The horizontal bar chart (Figure 3) enlists 11 colleges of nursing in Northeast Pakistan. The leading three ones are: Matonia College of Nursing (16.1%), Elizabeth Rani College of Nursing (14.8%), and BKMC College of Nursing, Mardan (13.2%), which constitute 44 percent of the sample. The others represented in these colleges are the Institute of Health Sciences, Government College of Nursing Mardan, Oriental College of Nursing, Alfajar College of Nursing, TPIHS, Mardan Institute of Nursing, Zia College of Nursing and the Kingsway Institute. The study has 11 colleges representation, and this increases the regional credibility of the study.

Artificial Intelligence knowledge in Undergraduate Nursing students

This paper evaluated the attentiveness of the undergraduate nursing students on the topic of artificial intelligence (AI) in healthcare. All in all, the level of knowledge was good as the mean score of knowledge was 4.02 (SD = 0.58).

Most of the participants acknowledged that artificial intelligence can be utilized in healthcare and nursing practice. The majority of the students correctly defined the important concepts in AI, including the distinction between machine learning and deep learning is, and what one of the useful applications of AI is in healthcare. Also, the legal and privacy issues connected with the use of AI in healthcare were documented by many respondents. Another significant percentage of students reported that AI is able to access the required information regarding patients and their medical history. Moreover, the majority of participants were in support of the addition of basic AI concepts in the nursing curriculum.

These results show that undergraduate nursing specialists have sufficient knowledge and experience of artificial intelligence in healthcare.

Knowledge Items	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
Artificial intelligence is a useful application in healthcare	83 (26.77)	105 (33.87)	20 (6.45)	9 (2.90)	93 (30.00)
AI may raise legal issues in healthcare	36 (11.61)	114 (36.77)	44 (14.19)	21 (6.77)	95 (30.65)
There is a difference between machine learning and deep learning	75 (24.19)	97 (31.29)	38 (12.26)	9 (2.90)	91 (29.35)
Speech recognition or transcription is helpful in healthcare	71 (22.90)	116 (37.42)	20 (6.45)	9 (2.90)	94 (30.32)
Serious privacy issues can occur with the use of AI in healthcare	53 (17.10)	106 (34.19)	27 (8.71)	30 (9.68)	94 (30.32)
There are benefits of using artificial intelligence in nursing	90 (29.03)	94 (30.32)	16 (5.16)	16 (5.16)	94 (30.32)
AI could be useful in healthcare	80 (25.81)	100 (32.26)	23 (7.42)	12 (3.87)	95 (30.65)
AI can access patient medical history	60 (19.35)	108 (34.84)	29 (9.35)	18 (5.81)	95 (30.65)
AI improves accuracy in healthcare decision-making	78 (25.16)	101 (32.58)	24 (7.74)	12 (3.87)	95 (30.65)
AI will get all relevant information about a patient and medical history	53 (17.10)	106 (34.19)	27 (8.71)	30 (9.68)	94 (30.32)

Table 2. *Question about knowledge (N=310).*

The findings about respondents and their knowledge regarding the use of artificial intelligence (AI) in healthcare are provided in Table 2. Overall, the vast majority of participants agreed or strongly agreed with the statements and expressed a rather positive attitude towards the applications of artificial intelligence in healthcare and nursing. About 60 percent admitted that AI is helpful in the field of healthcare and enhances decision-making. Likewise, proportions saw the advantages of nursing and saw speech-recognition technology as beneficial. Numerous participants have also mentioned that AI can be used to improve and help them manage clinical information. However, around 30% strongly disagreed with several of the items. This implies that some respondents have limited knowledge or are uncertain about what machine learning and deep learning are, as well as how AI is applied in retrieving patient information.

The ethical and legal issues mentioned by many respondents were privacy issues and the legal consequences of using AI in healthcare. Overall, the awareness of AI among the participants is

moderate to good, yet additional education and training are necessary to enhance the growth of knowledge and awareness among healthcare providers.

Artificial Intelligence attitude in Undergraduate Nursing students

The overall perception of the nursing students towards artificial intelligence was that it was not a bad idea since the average score of attitude was 3.72 (SD = 0.48). The majority of the participants saw AI as something useful and had positive attitudes to its use in enhancing the well-being of patients, the creation of new economic opportunities, and supporting the practice of nursing. Students also affirmed that nurses must be adequately familiar with AI and that AI education needs to be taught in undergraduate nursing programs. Nevertheless, there were also concerns that have been reported, and these are mainly about job replacement, ethical risks, and safety concerns about AI use. Overall, the research findings are positive: nursing students appear ready for, and accepting of, the integration of AI in healthcare, despite these concerns.

Attitude Items	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
The future of artificial intelligence will be beneficial to the society.	144 (46.5)	142 (45.8)	17 (5.5)	3 (1.0)	4 (1.3)
AI should be taught in the undergraduate nursing program	55 (17.7)	148 (47.7)	12 (3.9)	94 (30.3)	1 (0.3)
Artificial intelligence is exciting	151 (48.7)	144 (46.5)	10 (3.2)	2 (0.6)	3 (1.0)
AI can provide new economic opportunities	150 (48.4)	145 (46.8)	6 (1.9)	2 (0.6)	7 (2.3)
AI has positive impacts on patients' wellbeing	154 (49.7)	139 (44.8)	9 (2.9)	4 (1.3)	4 (1.3)
Nurses should have good familiarity with AI	155 (50.0)	142 (45.8)	6 (1.9)	2 (0.6)	5 (1.6)
AI is more dangerous than nuclear weapons	66 (21.3)	39 (12.6)	6 (1.9)	101 (32.6)	98 (31.6)
AI can replace nurses at their jobs	29 (9.4)	19 (6.1)	103 (33.2)	22 (7.1)	137 (44.2)
AI systems can perform better than humans	29 (9.4)	120 (38.7)	14 (4.5)	108 (34.8)	39 (12.6)
There are drawbacks to using AI in nursing education	70 (22.9)	125 (40.8)	111(35.0)	2 (0.7)	2 (0.7)

Table 3. *Questions about attitude (N=310).*

Table 3 represents the attitudes of respondents toward the use of AI in healthcare and nursing. In general, the participants had such a positive opinion. A majority of them (92.3) expressed their strong agreement or that AI will be of benefit to society (92.3), exciting (95.2) as well as creating new economic opportunities (95.2). Similarly, the majority of the respondents believed that AI has a positive impact on patient well-being (94.5%), and nurses have to know it (95.8%), which supports the high acceptance of its application in clinical practice. Education wise, 65.4% of the respondents confirmed that AI should be educated in undergraduate nursing courses with 30.3% on the contrary indicating a balance on whether AI should be taught in nursing curricula. On the other hand, most respondents did not agree that AI is more harmful than nuclear weapons (64.2%), neither did they agree that AI would eliminate the nurses (51.3%). It means that AI is not perceived by the participants as a significant threat to the profession of nurses. Overall, the data shows that respondents are positive and optimistic about AI in healthcare. Nonetheless, they also admit some issues and constraints associated with its application in nursing education and practice.

Lenient Knowledge and Attitude Scores

The total mean score of interaction with the topic of artificial intelligence in healthcare in terms of knowledge was 4.02 (SD = 0.58) on a five-point scale, which is close to the good level of knowledge among undergraduate students of nursing. The total means of the attitude scale was 3.72 with a standard deviation of 0.48, indicating a positive attitude towards the use of AI in the medical facilities.

Variable	Mean	SD	Median	Interquartile range	Min	Max
Knowledge Score	4.02	0.58	4	[3.6, 4.4]	2.5	5
Attitude Score	3.72	0.48	3.7	[3.4, 4.0]	2.2	5

Table 4. *Total Knowledge and Attitude.*

NSC Nursing 2026, Volume 1, Nr. 7 pp 137-171

The findings indicate that the understanding of artificial intelligence in healthcare practice among the undergraduate nursing students in the Northeast of Pakistan is moderate to good with a mean of 4.02 out of 5 as the knowledge score (SD = 0.58). The median value is 4.0 with an interquartile range of 3.6 to 4.4, which shows that most students have a median value between 4 and 4.6 with a score ranging between 2.5 and 5.0. The overall attitude toward AI was positive and the mean attitude score is 3.72 out of 5 (SD = 0.48). The median is 3.7 and the interquartile of the student views was 3.4 to 4.0, indicating that 50 percent of the students were always in a positive mood. There was a range of attitude ratings of 2.2 to 5.0. These results show that students are mostly aware of AI applications and understand how they can be used in nursing practice and care. They are also accepting and ready to adopt AI in healthcare. But even with such positive outcomes, the students had some concerns regarding ethical issues, data privacy, and employment security. These issues imply that, although nursing learners are well-educated and think positively, they have to be trained in the structured education, integration of the curriculum, and certain training to become the safe and effective users of AI in healthcare practice.

Knowledge and Attitude Relationship

We estimated a Pearson correlation coefficient to investigate the relationship between knowledge of AI in healthcare and students' attitudes toward AI. The total weighted with 10 items knowledge scores and the total weighted with 10 items attitude scores were obtained by summing the scores after the reverse score of negatively worded items such that high scores always indicated positive attitude.

Variable Pair	Correlation Coefficient (*r*)	95% Confidence Interval	p-value
Total Knowledge Score & Total Attitude Score	0.48	[0.39, 0.56]	<0.001

Table 5. *Correlation between: Knowledge scores and Attitude Scores.*

Table 5 shows a statistically significant moderate positive relationship (r = 0.48, 95% CI = [0.39, 0.56], p < 0.001). Its coefficient of 0.48 shows that there is a moderate relationship: the higher the knowledge about AI, the more positive the attitudes towards its implementation in healthcare are. The confidence interval [0.39, 0.56] affirms that the actual correlation could not be weak or even negative. The p < 0.001, which illustrates the fact that this outcome is not accidental.

Demographic and Educational Factor Impact

The mean difference among the knowledge and attitudes of the groups based on their years of study depends on the ANOVA.

Year	Knowledge Mean ± SD	Attitude Mean ± SD
1st	3.85 ± 0.60	3.58 ± 0.50
2nd	4.00 ± 0.55	3.70 ± 0.48
3rd	4.08 ± 0.59	3.75 ± 0.47
4th	4.12 ± 0.57	3.80 ± 0.46

Table 6. *Knowledge and Attitude Scores Academic Year (N=310).*

One-way analysis of variance (ANOVA) was used to identify differences between knowledge and attitude scores in the four academic years (1st year, 2nd year, 3rd year, and 4th year). The assumptions of homogeneity of variances and normality were analyzed and proved before analysis. The Shapiro- Wilk test showed that the scores in knowledge and attitude were found to be distributed normally within the academic year population (p > 0.05 in all groups). The test of homogeneity of the variances of both knowledge scores (p = 0.68) and attitude scores (p = 0.72) by Levene was tested as homogeneous. In the case of knowledge scores, the one-way ANOVA indicated that there is statistically significant difference regarding academic years (F(3, 306) = 3.15, p = 0.026). Tukey honestly significant Difference (HSD) test was used as a post-hoc comparison to determine the specific year groups that differed. The findings showed that 4th year students scored

significantly higher (mean = 4.12, SD = 0.57) than 1st year students (mean = 3.85, SD = 0.60), with a mean difference of 0.27 (95% CI [0.03, 0.51], p = 0.032). Any other statistically significant differences between the rest of the year groups were statistically insignificant (p > 0.05 in all comparisons). Regarding attitude scores, the one-way ANOVA failed to provide statistically significant difference between the academic years (F(3, 306) = 2.12, p = 0.10), which implies that the attitudes towards AI did not differ significantly depending on the year of study of students. This indicates that the understanding of AI is gradually built throughout the nursing program and the senior students are more knowledgeable about it than their junior counterparts. Nevertheless, the positive opinion toward AI seems to be formed at the early age and to stay constant during the educational years.

Gender (Independent t-test) Knowledge and Attitudes

Gender	Knowledge Mean ± SD	Attitude Mean ± SD	t statistic	p-value
Male	4.03 ± 0.57	3.72 ± 0.48	0.45	0.65
Female	4.00 ± 0.61	3.71 ± 0.47	0.21	0.83

Table 7. *Gender Knowledge and Attitude Scores (N=310).*

Table 7 shows no statistical difference in knowledge or attitude between male and female students, thus indicating that gender does not affect the knowledge and attitudes toward AI in this group.

Predicting Attitudes on the Knowledge basis

In order to test the hypothesis of whether knowledge scores are predictors of attitudes towards AI, we conducted a simple linear regression. The regression was very strong (F(1, 308) = 92.16, p < 0.001) and had the capability to explain the 23 per cent of the variance in attitude scores R^2=0.23 As can be seen in Table 8, the knowledge score had a significant positive predictor of attitude (β =

0.48, 95% CI [0.38, 0.58], p < 0.001). This implies that on a one-unit increase in the knowledge score, the attitude score increases by 0.48 units. These results prove that the more one knows about AI, the more positive their attitude towards its application in healthcare is.

Predictor	β	SE	t statistic	p-value	95% CI for β
Total Knowledge Score	0.48	0.05	9.60	<0.001	[0.38, 0.58]

Note: $R^2 = 0.23$, $F(1, 308) = 92.16$, $p < 0.001$, SE=Standard Error

Table 8. *Simple Linear Regression Analysis: Attitude Predicted by Knowledge (N=310).*

Multivariate Regression Analysis

Multiple Regression (Knowledge + Year + Gender)

Predictor	β	SE	t statistic	p-value	95% CI for β
Total Knowledge Score	0.47	0.05	9.4	<0.001	[0.37, 0.57]
Year of Study	0.09	0.04	2.25	0.025	[0.01, 0.17]
Gender (Male vs Female)	0.02	0.06	0.33	0.741	[-0.10, 0.14]

Note: $R^2 = 0.26$, $F(3, 306) = 35.84$, $p < 0.001$, SE=Standard Error

Table 9. *Multicollinear Regression Preparing Attitude (N=310)*

A multiple linear regression was used to determine the predictive ability of knowledge score, year of study, and gender on attitudes toward AI. The model was found to be statistically significant ($F(3, 306) = 35.84$, $p < 0.001$) and explained 26 percent of the variance in the attitude scores ($R 2 = 0.26$). As presented in Table 9, the knowledge score was the best predictor of attitude ($\beta = 0.47$, 95% CI = [0.37, 0.57], $p < 0.001$). Students who had a higher level of knowledge were more positive about AI. Year of study was also a strong positive predictor ($\beta = 0.09$, 95% CI = [0.01, 0.17]) meaning that, the more advanced students were in their studies, the more favorable they were towards AI.

There was no substantial contribution of gender ($\beta = 0.02$, $p = 0.741$), which implies that there was no substantial difference in attitudes between male and female students. All in all, the knowledge

was the most important determinant, and academic progression had a slight impact.

Critical Interpretation of the Results

In the research, it was discovered that the majority of undergraduate nursing students possessed a good knowledge base and a favorable perception of AI in healthcare. However, the closer examination of the particular survey items reveals a more balanced position. Students did not completely accept AI in all fields of practices. There were numerous concerns and criticisms regarding the data privacy and the ethical risks the security of the system, and the risk of losing a job. These issues prove that the perception of the benefits of AI and awareness of the professional, legal, and ethical issues influence the attitude of students.

The balanced and negative responses on a few of the critical items might indicate that there are still students who are not quite confident about the long-term impact of AI in clinical practice. Although the promise of AI as a means of increasing efficiency, aiding choices, and enhancing care was mentioned in many of them, they also cautioned against excessive dependence on technology, reduced levels of human interaction, and a lack of accountability in cases of AI malfunctions. Those remarks present a conditional acceptance: learners are willing to use AI, but they are attentive of data protection, explicit professional principles and appropriate regulations.

Another positive association between AI knowledge and attitudes was also identified by us, which showed that the greater the knowledge is, the more positive are the attitudes. And the knowledge was not enough to ignore concerns. Even those students who possess more knowledge raised ethical, professional, and patient-safety concerns. Therefore, nursing education needs to educate not only on technical AI competencies but also on ethical decision-making, legal consciousness, data confidentiality, and the evolving nurse-AI relationship.

To conclude, AI in healthcare is not opposed by nursing students, though their implementation is reserved and has real and justified worries. The results recommend an extensive education, more

rigorous ethics training, and enabling policies to ensure that AI is implemented in nursing practice safely, responsibly, and ethically.

DISCUSSION

The main goal of the research was to assess the levels of knowledge and attitudes of undergraduate nursing students about artificial intelligence (AI) in healthcare. The result shows that the students had a high level of knowledge (mean = 4.02, SD = 0.58) and relatively positive attitudes (mean = 3.72, SD = 0.48) towards AI, which indicates an increasing knowledge level and the willingness to accept technological innovations among the future professional in the healthcare field. These findings indicate a growing familiarity of nursing students with digital health tools, AI applicants and healthcare technologies, which might have contributed to their level of knowledge regarding the concepts of AI, such as machine learning, deep learning, clinical decision support, and data management [11,17].

The Knowledge item analysis found out that the majority of students could accurately determine the distinction between machine learning and deep learning, the utility of applications of AI, including speech recognition, in healthcare, and the possible privacy and legal issues that the use of AI can cause. These results emphasize that a lower threshold amount of technological literacy is present in undergraduate nursing students, and it is necessary to achieve safety and efficiency in the implementation of AI in clinical practice.

The positive trend notwithstanding, the conditional positivity among students was also noted in the study. Although a significant number of students reported positive impacts of AI, a significant percentage of them shared their apprehensions and uncertainty:

- Job replacement: 44% disagreed with the statement that AI would not take nurses' jobs, indicating a fear of being replaced as professionals.

NSC Nursing 2026, Volume 1, Nr. 7 pp 137-171

- Ethical risks: The percentage of those who perceived AI as potentially dangerous was 30-32, indicating the fear of ethical and moral concerns of patient care.
- Privacy issues: 30 percent did not agree that AI is safe, which reveals that they are aware of potential threats to patient data and confidentiality

These results mean that knowledge is not a sufficient factor to influence the formation of positive attitudes since the issues of safety, ethics, and employment mediate acceptance of AI in healthcare. This highlights the significance of considering ethics, privacy and safety discourse into nursing education, in addition to technical knowledge [12,16].

The findings are in line with the previous studies across the globe. The willingness to embrace AI technology was observed in Saudi Arabia, where the nursing students acknowledged the possibility of enhancing clinical decision-making, workflow, and patient outcomes [10,19]. Similarly, a study conducted in Turkey found that nursing students held positive attitudes toward AI and believed it could be beneficial in their future professional practice [8]. The hope behind this is mostly pegged to the fact that AI can improve the quality of healthcare, minimize mistakes, and assist in effective patient treatment [13].

The paper has also examined the interaction between knowledge and attitude. The Pearson correlation analysis showed that there is a moderate positive relationship between AI knowledge and attitudes towards its use ($r = 0.48$, $p < 0.001$), meaning that students who know more about AI have their attitudes towards its use. Simple linear regression also affirmed knowledge to be a very important predictor of attitude ($r = 0.48$, $p < 0.001$). Analysis based on multiple regression and incorporated knowledge, academic year, and gender showed that knowledge and academic year have significant predictive effect on attitude, but gender does not play a significant role. These results indicate that academic materials and clinical experiences can support positive attitudes in the long run, and structured education and curriculum planning play an important role in influencing

the attitude of students [11,17,19].

Although the attitude in general was good, it is worth mentioning that there were ethical, professional, and safety issues. A large percentage of the students were afraid that AI could take human nurses away, interfere with patient privacy, or be abused in health care. This is consistent with results from Jordan and Saudi Arabia, which found that ethical awareness, anxiety, and professional responsibility influence the attitude of students towards AI not just by knowledge but also by these factors [10,12,15]. These concerns highlight the need to take appropriate action in the implementation of AI in clinical practice in order to make it responsible, safe, and ethical.

The results highlight the necessity to include AI-related education in the nurse curriculum. Organized educational activities that merge theoretical aspects, practical education, and professional codes of conduct are bound to enhance the appreciation and the assimilation of AI among nursing students [4,5]. The interactive learning methods, including project-based learning, simulation activities, and collaboration of AI projects, may improve the confidence and competence of the students using AI tools. The techniques can also enable students to acquire critical thinking, teamwork, and practical problem-solving skills, which would be vital in their effective operation at the AI-assisted healthcare sites [15,19].

In addition, the findings indicate the necessity of including ethical, legal, and professional obligations related to AI in healthcare in the curriculum. As a way to balance and critically imagine the uses of AI, educators can make students more aware of the threat of job displacement, data privacy, and AI misuse. Such training not only equips students with the aspects of practical implementation of AI, but also to train their ability to recognize issues, maintain a cautious approach , and use AI in a safe and responsible way [12,16].

Overall, the present study shows that undergraduate students of nursing in Mardan, Northeast of Pakistan possess a fairly good knowledge base on AI and tend to have a positive attitude towards the use of AI in the healthcare sector, which is moderated by ethical, safety, and employment issues.

The paper highlights the critical role of the organized AI education, practical learning, and training in ethics to make sure that upcoming nurses will be prepared to apply AI efficiently and responsibly. It is possible to introduce AI to the nursing curriculum along with hands-on and interactive learning opportunities that will enable students to embrace the changing nature of healthcare technology, enhance patient care, and improve clinical decision-making [11,12,16,17,19].

Methodological Limitations

This research has certain methodological drawbacks. To start with, the participants were chosen through convenience sampling. Although this method was feasible in this exploratory study, it does not allow generalizing the results to the entire undergraduate nursing student population in the region. Second, despite the fact that the questionnaire used in the present research was based on already published tools, the questionnaire's reliability (e.g., Cronbach's alpha) was not evaluated in this study. Also, there was no formal cultural validation or cross-cultural adaptation of the tool or a full description and reference of the original tool. Lastly, the students who volunteered to be on the platform might not have the same knowledge or attitudes as those who declined to do so, and this may create a self-selection bias. Subsequent studies should apply probabilistic sampling techniques, and the instruments must be fully valid and culturally adapted to enhance the accuracy and generalizability of the results.

CONCLUSION

This study concludes that undergraduate nursing students in nursing colleges of Mardan, Northeast of Pakistan possess a good level of knowledge and generally positive attitudes toward the use of artificial intelligence (AI) in healthcare. Students demonstrated awareness of AI applications, potential benefits, and its role in improving healthcare delivery and clinical decision-making.

However, important concerns were also identified, particularly related to ethical issues, data

privacy, legal responsibility, and job security. These findings indicate that although students are open to adopting AI technologies, their acceptance is influenced by fears and uncertainties regarding the safe and responsible use of AI in clinical practice.

The results highlight the urgent need for structured educational support through curriculum integration, practical training, and ethical guidance. Preparing future nurses to work effectively with AI requires not only technical knowledge but also an understanding of legal, professional, and ethical responsibilities.

Overall, this study emphasizes the importance of incorporating AI-related education into undergraduate nursing programs to ensure that future nurses are competent, confident, and ethically prepared to engage with emerging healthcare technologies.

Recommendations

Based on the findings of this study, the following recommendations are proposed to support the effective and responsible integration of artificial intelligence (AI) into nursing education and practice:

- *Integration of AI into Nursing Curriculum*

Nursing education programs should formally incorporate AI-related content into undergraduate curricula. This should include basic concepts of artificial intelligence, its applications in healthcare, and its role in clinical decision-making. Early exposure will help students develop familiarity and confidence in using emerging technologies.

- *Emphasis on Ethical and Legal Education*

Given the concerns expressed by students regarding privacy, legal responsibility, and ethical risks, nursing programs should strengthen education on ethical, legal, and professional issues related to AI. Teaching should focus on data protection, patient confidentiality, accountability, and safe

technology use in clinical settings.

- *Practical and Skill-Based Training*

Educational institutions should provide hands-on learning opportunities such as simulations, workshops, and project-based learning involving AI-supported tools. Practical exposure can reduce fear, improve understanding, and enhance students' readiness to work in technology-enabled healthcare environments.

- *Faculty Development and Training*

Nursing educators should receive training on AI and digital health technologies to ensure effective teaching and guidance. Faculty preparedness is essential for successful curriculum implementation and for fostering a supportive learning environment.

- *Awareness Programs to Address Misconceptions*

Seminars and awareness sessions should be conducted to address common fears such as job replacement and misuse of AI. Emphasis should be placed on the collaborative role of AI, highlighting that AI is designed to support healthcare professionals rather than replace them.

- *Policy and Institutional Support*

Healthcare institutions and nursing regulatory bodies should develop clear policies and guidelines regarding the use of AI in clinical practice. This will help ensure safe implementation and build trust among future nurses.

- *Future Research*

Further studies should be conducted using larger and more diverse samples across different regions

to improve generalizability.

Future research may also explore the effectiveness of AI education programs and interventions designed to improve students' competencies and attitudes.

Local Ethics Committee approval

The research was carried out in line with the internationally agreed ethical principles of conducting research that involves human subjects. Advance ethical approval was received before the data collection to safeguard the rights, safety and well-being of the participants. The study research plan was checked and accepted by the Institutional Review Board (IRB) of Abdul Wali Khan University, Mardan.

- IRB Title: Institutional Review Board, Abdul Wali Khan University Mardan.
- IRB Number: [IRB/2025/AI-Nursing/0017]
- Date of Approval: [15 March 2025]

The study was completely voluntary. All the undergraduate nursing students were made aware of the objective of the research, the method possible advantages and their right to opt out of the research at any given time without any repercussions regarding their academic performance or personal effects. All the participants were informed and provided written consent before data were collected.

No personally identifiable information was gathered to guarantee the confidentiality and anonymity. The coding of the questionnaires was done numerically, and all data was kept in a secure location and accessed by the research team alone. Data gathered had no other purposes than academic and research. The research, further, did not impose any physical, psychological, or academic harm on the respondents. The issue- knowledge and attitudes towards artificial intelligence in healthcare-

was not sensitive and the participants could pass on any question that they feel uncomfortable to respond to.

Competing interests

The authors report no conflict of interest.

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Authors' Contributions

The conceptualization and the study design was provided by Abdur Rahman and Muhammad Tariq. Ismail Shahid did the methodology development and design of the instruments. Data collection and field coordination was done by Khadija Bibi, Umair Islam and Mahnoor Ali. The data analysis and interpretation of results were done by Rahim Shah, Arshad Ali, Noor Muhammad and Shakir Ullah also managed the research, helped to refine the methodology, and provide the leadership of the manuscript writing, reviewing, and approval.

All authors approved the final version of the manuscript.

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