RESEARCH ARTICLE

Delivering Integrated Diabetes Care: Nursing Management Experiences in a Primary Health Center Model in Indonesia

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Abstract

Background: Diabetes mellitus (DM) is a significant public health issue, with its rates steadily climbing in Indonesia and throughout Southeast Asia. Managing chronic conditions like DM is complex and calls for integrated, structured, and patient-focused care, particularly at the primary care level. Understanding the experiences of nurses in this setting is crucial for enhancing health systems.

Method: To delve into the lived experiences of nurses and patients managing DM care, a qualitative phenomenological approach was used. In-depth interviews were held with five participants, three nurses and two patients, between August and September 2020. The data was analyzed using Colaizzi's seven-step method to extract thematic insights.

Findings: Three key themes emerged that highlighted the interconnected roles in DM care: (1) Strengthening Governance for Integrated Diabetes Care, which emphasizes the significance of health insurance, referral systems, and facility preparedness; (2) Delivering Person-Centered, Collaborative Care, focusing on interprofessional education, digital communication, home-based services, and the commitment of providers; and (3) Empowering Patients and Fostering Peer Support, and these showcased the importance of peer-led initiatives and social engagement in enhancing treatment adherence, as well as overall well-being. These themes reflected the systemic, professional, and patient-centered dimensions that collectively constituted the quality nursing care conceptual model.

Conclusion: Integrated diabetes care in Indonesian primary health settings thrived on the collaboration of government policies, community health center services, and patient involvement. The findings underlined the necessity for ongoing intersectoral collaboration and community-based strategies to bolster chronic disease management in resource-limited environments.

Keywords: *Diabetes mellitus, quality nursing care model, primary health care, community engagement, Southeast Asia, Indonesia*

Introduction

Diabetes mellitus (DM), particularly type 2, is becoming a major public health concern in Indonesia. The numbers are climbing, fueled by rapid urbanization, more sedentary lifestyles, and shifts in dietary habits. Recent estimates indicate that Indonesia ranks among the top ten countries with the highest number of adults living with diabetes, and sadly, many cases remain undiagnosed or poorly managed. The primary healthcare system is vital in tackling chronic diseases, with nurses playing a key role in providing diabetes education, supporting medication adherence, and offering lifestyle counseling. However, nurses often encounter obstacles such as limited time, inadequate training in diabetes care, and a shortage of resources.

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Research showed that many nurses are grappling with significant burnout and often miss opportunities to provide care due to overwhelming demands and insufficient staffing (White et al., 2019). On the patient side, challenges like low health literacy, hesitance to voice concerns, and a limited grasp of how to manage their conditions lead to less-than-ideal care experiences (Du Pon et al., 2019). These issues are compounded by gaps in care continuity and the absence of structured models that cater to Indonesia's unique cultural and healthcare landscape. In contrast, countries that have embraced diabetes specialist nurse models have reported improved patient outcomes and more efficient care (Valverde et al., 2021).

Given these challenges, it is essential to explore how Indonesian patients with type 2 diabetes experience nursing care in primary care settings. This study aimed to dive into the real-life experiences of these patients, identify the factors that influence their engagement and satisfaction, and uncover any gaps in service delivery. Moreover, it sought to gather insights on the types of nursing services that the community considers vital and beneficial. By having exemined these perspectives alongside the current capacity and availability of nursing services, the study aimed to develop a nursing care service model that aligned community needs with nursing service provision. The themes that emerged from the data will help shape a framework for exceptional nursing care, serving as a roadmap to enhance the quality, responsiveness, and sustainability of diabetes care within Indonesia's primary healthcare system.

Methodology

This study took a closer look at the services that could use some improvement to better meet community service requests. The qualitative data gathered aimed at understanding the perspectives of the nurse participants towards the development of a nursing care service model. Key themes and subthemes were derived that led to the development of a model for quality nursing care, which can serve as a guiding framework for delivering these services.

Design

This research adopted a qualitative approach with a phenomenological design, involving in-depth interviews with diabetes mellitus patients and the nurses who care for them at the Community Health Service Center. The goal was to gather insights about the services that have been received and those provided to the community. The information gathered gave insights on the implementation of nursing care management for diabetes mellitus patients in primary care settings.

Setting and participants

The study involved 2 diabetes mellitus patients and 3 nurses who provide care for these patients. Participants were chosen through purposive sampling. The inclusion criteria for diabetes mellitus patients required them to have used nursing care services in primary care, specifically at community health centers, for at least one year. For nurses, the criteria included having provided care to diabetes mellitus patients for a minimum of one year.

Data Collection

This study took place in the Special Region of Yogyakarta Province, specifically in a community health center area where there was a significant number of diabetes mellitus (DM) patients. The timing and location for data collection were agreed upon by all parties involved. Three nurses were interviewed at a set location, while DM patients were interviewed at a mutually agreed time, with each face-to-face session lasting up to 90 minutes. During these interviews, a structured questionnaire guided the data collection to ensure that everything the participants shard were captured.

Data Analysis

For data analysis, Colaizzi's seven-step method was employed. In addition, the researcher utilized the consolidated criteria for reporting qualitative research (COREQ) checklist to assist in compiling the research findings.

Trustworthiness of the Study

To ensure the accuracy of the transcribed interview data, the researcher conducted a confirmation check with all participants. Everyone agreed with the themes that emerged from the validation process. Furthermore, a peer audit was carried out with the research team to verify the accuracy of the research and the themes derived from the interview data.

Ethical consideration

When it came to ethical considerations, collection of interview data respected the rights of the participants involved. The researcher took the time to clearly explain the purpose and goals of the study to the participants beforehand. Once they grasped what the research was about, informed consent was provided. Furthermore, the

researchers did not pressure anyone into participating. Confidentiality was a top priority, ensuring that what participants shared remained private. Finally, the researchers obtained a letter confirming that there were no ethical violations from the health research ethics institution, with the registration number Skep/090/KEPK/VIII/2020.

Findings and Discussion

This study explored the essential components of excellent diabetes care and nursing service delivery in a community health center. The experiences of five women, three nurses and two diabetes mellitus (DM) patients, revealed **three overarching themes**, each comprising sub-themes. These themes reflected the systemic, professional, and patient-centered dimensions that collectively constitute quality nursing care. The resulting conceptual framework was illustrated in Figure 1: *Model of Quality Nursing Care in Community Health Centers* illustrated at the end of this section.

From the interviews, three overarching themes emerged to describe the essential components of excellent diabetes care and nursing service delivery in the community health center. Each theme included related sub-themes grounded in participants' narratives as presented and discussed below:

Theme 1: Strengthening Governance for Integrated Diabetes Care

This theme highlighted how crucial it was to have solid institutional policies and effective systems in place in order to ensure diabetes management is accessible, efficient, and well-coordinated. In the context of Indonesia and the wider Southeast Asian region, enhancing governance means tackling the complexities of decentralized health systems, finding the right balance between national policies and local execution, and tapping into cultural and community strengths to support ongoing care for chronic diseases.

Sub-theme 1.1: Health Insurance and Financial Access

Participants pointed out that the National Health Insurance Program (NHIP), known in Indonesia as Jaminan Kesehatan Nasional (JKN) under BPJS Kesehatan, played a significant role in making diabetes care more accessible. This program covered essential services like lab tests, medications, and primary consultations for those registered as diabetes patients.

> "The laboratory examination is covered by national health insurance… including participants from the DM community who are actively registered." (P1)

The Indonesian JKN scheme stood out as one of the largest single-payer health insurance programs in the world, with the goal of achieving universal health coverage. It was vital for lowering out-of-pocket costs and enhancing access to non-communicable disease (NCD) management, especially in rural and peri-urban areas. However, there were still hurdles to overcome, such as capitation limits, slow reimbursements, and inconsistent service availability in remote locations (BPJS Kesehatan, 2017; Agustina et al., 2019).

From a Southeast Asian perspective, financial protection is not just a policy issue but also a matter of equity, especially in regions where informal labor markets are prevalent. Including diabetes services under the NHIP is a step forward in health financing, but it needs to be continually adjusted to fit local circumstances, such as ensuring that unregistered or migratory populations, which are common in many areas of Indonesia, can also access these services.

This theme underscored the importance of institutional policies and systemic structures in enabling accessible, effective, and coordinated diabetes management. Within the Indonesian and broader Southeast Asian context, strengthening governance involves navigating decentralized health systems, balancing

Table 1. *Characteristics of Participants n = 5*

Code	Gender	Age	Position	Education
P1	Woman	45	Nursing	Bachelor
P2	Woman	51	Nursing	Bachelor
P3	Woman	35	Nursing	Bachelor
P4	Woman	50	Patient DM	Senior High School
P5	Woman	40	Patient DM	Senior High School

national policy with local implementation, and leveraging cultural and community dynamics for sustained chronic disease care.

Sub-theme 1.2: Referral Systems and Advanced Treatment

Effective referral pathways played a crucial role in managing complications like diabetic ulcers and renal dysfunction, ensuring that patients can smoothly transition from primary care centers (puskesmas) to tertiary hospitals.

> "…DM ulcers are treated at the health center or referred to the hospital's surgical polyclinic with appropriate documentation." (P1)

This reflects Indonesia's tiered health service system, where puskesmas act as gatekeepers, and patients are required to follow specific referral protocols. The success of these pathways relied heavily on nurse-led triaging and coordination between facilities, and the availability of specialized services. While these systems promote integrated chronic care, challenges can arise due to geographic differences, transportation issues, or administrative delays, problems that are often seen in many archipelagic and rural areas of Southeast Asia (Febrian et al., 2020; WHO SEARO, 2022).

The participants' focus on the importance of proper documentation and coordination highlighted the evolving role of nurses, not just as caregivers but also as navigators within the health system, ensuring referral compliance and advocating for timely access to specialists.

Sub-theme 1.3: Infrastructure and Facility Readiness

Even with supportive policies in place, the lack of proper infrastructure, like limited hall space and insufficient equipment, has really held back the growth and sustainability of diabetes programs.

> "Our hall only fits 40 people. We can't add more because of space limitations." (P1)

The readiness of facilities is a crucial factor in determining the quality of services, especially in decentralized health systems such as Indonesia's where local governments share the responsibility for funding and managing these facilities. This resulted in significant differences in the capacities of health centers. Participants shared various adaptive strategies, like rotating session schedules, moving education outdoors, or focusing on home-based care for those at higher risk, showing remarkable resilience and creativity at the community health level (Meiriana et al., 2019).

This scenario mirrored broader trends across Southeast Asia, where rapid urban growth, increasing populations, and competing health priorities often put a strain on infrastructure. Still, the community-driven spirit of Indonesian primary care, highlighted by initiatives like Prolanis (Program Pengelolaan Penyakit Kronis), demonstrated the potential for localized, participatory approaches to managing chronic diseases, even in the face of structural challenges.

Theme 2: Delivering Person-Centered, Collaborative Care

This theme illustrated the diverse roles that health professionals play in providing holistic, interdisciplinary, and patient-centered diabetes care. In Indonesia, where the healthcare system is decentralized and culturally rich, person-centered care is not just a clinical approach but also a cultural imperative. Collaborative, community-driven methods resonated with *gotong royon*g (mutual cooperation), a core value in Indonesian culture that emphasized shared responsibility for health and well-being.

Sub-theme 2.1: Interprofessional Education and Counseling

Participants pointed out how structured, team-based educational sessions involving nurses, doctors, dentists, physiotherapists, and nutritionists can significantly enhance patients' understanding of diabetes management.

> "We have educational meetings with health professionals, including nurses, doctors, dentists, and nutritionists." (P2)

This strategy aligned with Indonesia's commitment to interprofessional collaboration, exemplified by initiatives like Prolanis, where chronic disease teams work within primary care environments. These multidisciplinary teams were essential for tackling the various challenges posed by diabetes, from managing blood sugar levels to foot care and nutrition, especially in underserved regions where access to specialists was limited (Bakhtiar et al., 2020).

Throughout Southeast Asia, such collaborative educational approaches were gaining recognition as cost-effective solutions that harness the unique strengths of each profession. They also promoted task-shifting, allowing nurses and community health workers to take on more significant roles in patient education, which is particularly vital in low-resource settings.This theme reflected the multidimensional role of health professionals in delivering holistic, interdisciplinary, and patient-focused diabetes services. In the Indonesian context,

where the healthcare system is decentralized and culturally diverse, person-centered care was both a clinical strategy and a cultural necessity. Collaborative, community-based approaches aligned well with gotong royong (mutual cooperation), a foundational value in Indonesian society that reinforces collective responsibility for health and well-being.

Sub-theme 2.2: Health Communication and Digital Engagement

The introduction of WhatsApp groups for real-time communication, health promotion, and gentle nudges has become a game-changer in keeping patients engaged.

> "We have a WhatsApp group... when there's a fasting blood sugar check, it's announced there…" (P1)

In Southeast Asia, digital tools like WhatsApp, Telegram, and Facebook groups are increasingly stepping in to fill the gaps in care continuity, particularly in rural or hard-to-reach areas. In Indonesia, mobile phone usage is widespread, even among lower-income communities, making digital health messaging a practical and scalable solution. These platforms provided peer support, send reminders, and allow direct communication with healthcare providers, which helps improve medication adherence and appointment attendance (Dalimunthe, 2015).

In addition, the use of digital platforms signified a culturally relevant shift towards relational care, where communication is informal, responsive, and rooted in social networks. This approach aligned well with the communal ways of interacting and collective learning that are prevalent in many Indonesian communities.

Sub-theme 2.3: Monitoring and Documentation of Health Status

Keeping an eye on blood sugar levels, HBA1C, and kidney function tests every month, jotted down in logbooks that patients carry, had become a vital part of diabetes care.

> "HBA1C and kidney function tests are done every six months. Each patient has a monitoring book." (P5)

These logbooks do more than just serve as clinical records; they empower patients to take charge of their health, boosting their self-awareness and sense of responsibility. In Indonesia's Prolanis program, these patient-held booklets and monitoring tools were crucial for managing chronic diseases in the community, especially where electronic medical records are not an option.

In Southeast Asia, these straightforward yet effective documentation methods are key to empowering patients and enhancing communication among health workers, enabling continuous care tracking and timely referrals (Andito & Aditya, 2019).

Sub-theme 2.4: Homecare and Accessibility of Services

Home-based services were crucial, especially for low-income patients or those facing mobility issues, like those with advanced diabetic wounds.

> "If patients can't afford care, they're picked up by ambulance and treated at the center without charge." (P3)

In Southeast Asia, there is a growing focus on homecare within primary health strategies to ease the burden on hospitals and bring healthcare closer to communities. In Indonesia, home visits by puskesmas staff, often including nurses and village midwives, are a key part of integrated outreach services, particularly for non-communicable diseases and maternal-child health.

These services were tailored to local needs, especially where transportation can be a challenge, and they resonated with culturally ingrained practices of personalized, family-oriented care. Homecare not only made healthcare more accessible but also helped to alleviate patient anxiety and build trust in the health system (Tristiningdyah, 2016).

Sub-theme 2.5: Human Resource Capacity and Professional Commitment

Even with demanding workloads, nurses showed a remarkable dedication and emotional fulfillment in caring for diabetes patients, which highlighted their professional identity and ties to the community.

> "My workload is quite heavy, but I feel satisfied because it contributes to our patients' health." (P2)

This observation captured the unique blend of challenges and pride that many Indonesian nurses face, as they juggled their roles as both healthcare providers and community advocates. The shortage of healthcare workers in primary care was a well-documented issue in Southeast Asia, that was made even more challenging by the increasing demands of their roles and administrative tasks (Rante, 2020). Yet, it is their intrinsic motivation, fueled by religious beliefs, a sense of social duty, and

a commitment to their profession, that keeps them dedicated, often without the financial or institutional backing they deserve.

These stories underscored the importance of investing in workforce development, while acknowledging that nurses are vital to the success of integrated diabetes care models.

Theme 3: Empowering Patients and Fostering Peer Support

This theme highlighted how patients can take charge of their own care and the positive impact of community support systems.

Sub-theme 3.1: Peer-Led Recovery and Social Engagement

Groups led by patients had been instrumental in promoting social interaction, managing finances, and providing psychosocial support, while being supervised by nurses.

> "Yes, they organize picnics and social events using their own funds. Nurses keep an eye on these activities and assess how they're going…" (P1)
>
> "Instead of staying home and overthinking, we get out and have fun whenever we can." (P5)

These stories illustrated a move away from passive care towards a more engaged approach to health, where patients actively participated in creating spaces for wellness. Engaging socially helped combat feelings of isolation and boosts mental health, as noted by Lufthiani & Karota (2019), who found that peer groups enhance self-efficacy and resilience. The supportive role of nurses in these groups underscored the importance of blending psychosocial and clinical care within community diabetes programs.

Synthesis Across Themes

This study emphasized the multifaceted role of nurses, showcasing them not just as caregivers but also as educators, advocates, communicators, and leaders within the community. The results revealed that outstanding diabetes management care was influenced by a blend of system-level support and teamwork across professions while empowering patients. However, to unlock the full potential of nurse-led care models, there was a need to tackle challenges like infrastructure issues, the absence of dedicated diabetes counselors, and the heavy workload that nurses faced.

In line with the ASEAN strategy aimed at transitioning from a focus on treatment to one that promotes and prevents health issues (Putri, 2017), this study suggested enhancing governance frameworks, broadening nurse training programs, and embedding patient-centered innovations into practice. When nurses are given the right tools and independence, they become vital players in building a resilient health system that can effectively manage chronic diseases.

These themes and subthemes are visually represented in Figure 1.

The Model of Quality Nursing Care Service in Community Health Centers offered a comprehensive approach to providing top-notch and patient-focused diabetes care. At its heart lies the mission to empower patients and to enhance health outcomes through three interconnected components: governance and system support, collaborative professional care, and patient empowerment.

The first component, *Governance and System Support*, laid the groundwork. It encompassed access to health insurance via the National Health Insurance Program (JKN), robust referral

Figure 1. *Model of Quality Nursing Care Service in Community Health Centers.*

systems for specialized care, and the necessary infrastructure to ensure services are continuous and efficient.

The second component, *Collaborative Professional Nursing Care*, highlighted the importance of teamwork among healthcare professionals, with nurses playing a pivotal role. This included coordinated training with other health experts, utilizing digital platforms like WhatsApp for communication, providing homecare services, and closely monitoring patient progress. Even with demanding workloads, the commitment of healthcare staff guaranteed consistent and compassionate care.

The third component, *Patient Empowerment and Peer Support*, emphasized the need to involve patients as active participants in their own care. This was facilitated through peer-led diabetes management clubs, community initiatives that promote social recovery, and emotional support that aids in long-term disease management.

A vital thread that weaved through all three components is *Nurse Leadership and Community Engagement.* Nurses act as facilitators and connectors, ensuring that care is relational, ongoing, and attuned to the community's needs.

This model offered an integrated and sustainable strategy, positioning nurses as key players in delivering fair and responsive diabetes services within primary healthcare environments.

Limitations

This study took a closer look at how diabetes services were managed, focusing on the experiences of both nurses and patients within Indonesian community health settings. While it had shed light on integrated care practices, the qualitative approach means that findings cannot be easily generalized. For future research, it would be beneficial to create, to implement, and to assess structured nursing care models using a mix of methods or longitudinal studies. Plus, adding quantitative measures of patient satisfaction and gathering insights from a wider range of stakeholders, like health administrators and policymakers, would help paint a fuller picture of the system-level factors that impact diabetes care delivery.

Conclusion and Recommendations

This study had shed light on the crucial role that nurses and community-based health systems play in providing integrated, person-centered diabetes care in Indonesia. Key governance mechanisms like health insurance, referral systems, and facility readiness have been vital in ensuring access and fairness. Meanwhile, collaboration among different professions, the use of digital communication tools, and organized monitoring have empowered both healthcare providers and patients. Furthermore, peer-led support groups have bolstered self-management, resilience, and culturally relevant health promotion. Despite facing infrastructural and systemic challenges, nurses have shown remarkable adaptability and leadership in enhancing chronic disease care at the grassroots level while mirroring broader efforts across Southeast Asia to create sustainable, community-driven solutions for non-communicable diseases.

To build on these achievements, it is suggested that there is a need to strengthen policy frameworks by broadening the National Health Insurance Program in order to encompass more diabetes services, including nutritional counseling and physiotherapy. Investing in human resources, especially through interprofessional and digital health training, is also crucial. Upgrading infrastructure at the primary care level can significantly enhance service delivery, particularly in underserved regions. It is essential to prioritize community empowerment through the formal integration of peer-led initiatives, with support from healthcare professionals. In addition, further research is necessary to evaluate the long-term effects and scalability of integrated care models. Lastly, increasing access to digital tools can improve communication and continuity of care, especially in remote or low-resource areas.

References

Al-Qazaz, H. K., Sulaiman, S. A., Hassali, M. A., Shafie, A. A., & Al-Nuri, R. (2020). The relationship between diabetes knowledge and self-care behaviors among patients with type 2 diabetes mellitus. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 13*, 3857–3864. https://doi.org/10.2147/DMSO.S26905

Alshammari, F., Al-Kandari, F., Al-Yahya, H., & Alghamdi, S. (2021). Barriers to effective diabetes education in primary healthcare settings. *International Journal of Nursing Practice, 27*(4), e12930. https://doi.org/10.1111/ijn.12930

American Diabetes Association. (2023). Standards of medical care in diabetes—2023. *Diabetes Care, 46*(Supplement 1), S1–S154. https://doi.org/10.2337/dc23-SINT

American Diabetes Association. (n.d.). Patient Education Library. *Professional.Diabetes.org*. Retrieved from https://professional.diabetes.org/clinical-support/patient-education-library

Andito, T., & Aditya, M. (2019). Optimalisasi pesan dalam buku edukasi pasien diabetes melitus melalui komunikasi visual.

DeKaVe, *12*(2), 35–41. http://journal.isi.ac.id/index.php/dkv/article/view/3522

Anggraeni, N. C., Widayati, N., & Sutawardana, J. H. (2020). Peran Perawat Sebagai Edukator Terhadap Persepsi Sakit pada Pasien Diabetes Mellitus Tipe 2 di Kabupaten Jember. *Jurnal Pendidikan Keperawatan Indonesia*, *6*(1), 66–76. https://doi.org/10.17509/jpki.v6i1.24364

Bakhtiar, R., Duma, K., & Aminudin. (2020). Implementation of Interprofessional Collaboration In Type 2 Diabetes Mellitus Care In Health Service Facilities. *Husada Mahakam: Jurnal Kesehatan*, *10*(2), 41–53. https://doi.org/http://dx.doi.org/10.35963/hmjk.v10i2.241

Basu, S., Molina, S., & Schneider, J. (2022). Impact of sugar taxes on diabetes prevalence and health care costs: A systematic review. *Health Policy and Planning, 37*(3), 305–316. https://doi.org/10.1093/heapol/czab135

BPJS Kesehatan. (2017). https://bpjs-kesehatan.go.id/bpjs/index.php/post/read/2017/476/BPJS-Kesehatan-Dukung-Gerakan-Masyarakat-Sehat-Germas-Melalui-Kegiatan-Promotiv-Preventif

Chia, Y. H., & Wong, L. P. (2022). Regional cooperation in health: The role of ASEAN Economic Community on chronic disease management. *Asia Pacific Journal of Public Health, 34*(2), 121–129. https://doi.org/10.1177/10105395221084730

Dalimunthe, H. A. (2015). Hubungan Antara Komuniksi Terapeutik Dengan Motivasi Mengikuti Panduan DSME (Diabetes Self Management Education). *Psikologi Konseling*, *7*(2). https://doi.org/https://doi.org/10.24114/konseling.v7i2.5120

Dall'Ora, C., Griffiths, P., Ball, J., Simon, M., & Aiken, L. H. (2020). Association of nurse staffing with hospital performance and patient outcomes: A systematic review. *International Journal of Nursing Studies, 102*, 103486. https://doi.org/10.1016/j.ijnurstu.2019.103486

Du Pon, E., Wildeboer, A. T., Van Dooren, A. A., Bilo, H. J. G., Kleefstra, N., & Van Dulmen, S. (2019). *Active participation of patients with type 2 diabetes in consultations with their primary care practice nurses – what helps and what hinders: a qualitative study*. https://doi.org/10.1186/s12913-019-4572-5

Febrian, M. R., Permatasari, P., Nurrizka, R. H., & RanggauniHardy, F. (2020). Analisis Implementasi Penyelenggaraan Promosi Kesehatan Rumah Sakit di Era Jaminan Kesehatan Nasional. *Jurnal Ilmiah Kesehatan Masyarakat*, *12*(1), 20–26. https://doi.org/https://doi.org/10.52022/jikm.v12i1.49

Hadman, S. (2021). Impact of a Diabetes Management Intervention in Primary Healthcare Providers. *Primary Health Care: Open Access*, *11*(9), 1–1. https://doi.org/10.35248/2167-1079.21.11.403

Hariani, L., & Perdanakusuma, D. (2012). Perawatan ulkus diabetes. *Jurnal Rekonstruksi & Estetik*, *1*(1).

Hodgson, S., Morgan-Harrisskitt, J., Hounkpatin, H., Stuart, B., & Dambha-Miller, H. (2022). Primary care service utilisation and outcomes in type 2 diabetes: a longitudinal cohort analysis. *BMJ Open*, *12*(1), e054654. https://doi.org/10.1136/BMJOPEN-2021-054654

Indrayani, I., Handayani, L., & Herawati, S. (2021). Effectiveness of Prolanis program implementation on glycemic control in primary care settings in Indonesia. *Journal of Public Health Research, 10*(1), 2102. https://doi.org/10.4081/jphr.2021.2102

Jafar, T. H., Gandhi, M., de Silva, H. A., Jehan, I., Khan, A., & Naheed, A. (2021). Role of laboratory monitoring in diabetes management: A narrative review. *Clinical Diabetes and Endocrinology, 7*(1), 11. https://doi.org/10.1186/s40842-021-00127-8

Jasmani, J., & Rihiantoro, T. (2017). Edukasi dan Kadar Glukosa Darah Pada Pasien Diabetes. *Jurnal Ilmiah Keperawatan Sai Betik*, *12*(1), 140–148. https://doi.org/http://dx.doi.org/10.26630/jkep.v12i1.371

Kahn, C., Franzini, L., & Fine, L. G. (2020). Management of diabetic foot ulcers: Referral pathways and treatment approaches. *Wound Repair and Regeneration, 28*(4), 441–450. https://doi.org/10.1111/wrr.12816

Kementerian Kesehatan, R. I. (2016). *Promosi Kesehatan*. https://promkes.kemkes.go.id/promosi-kesehatan

Khoury, Z. H., Illesca, P., & Sultan, A. S. (2020). *The role of primary care providers in oral health education for patients with diabetes*. https://doi.org/10.1016/j.pec.2020.11.020

Lee, S. J., & Lee, H. S. (2022). Leadership support and nurse empowerment in diabetes care delivery: A systematic review. *Journal of Nursing Management, 30*(3), 717–727. https://doi.org/10.1111/jonm.13555

Lin, M., Chen, C., & Tsai, Y. (2023). Nurse-led homecare services improve wound healing and reduce anxiety in diabetic patients with ulcers: A randomized controlled trial. *International Journal of Nursing Studies, 138*, 104429. https://doi.org/10.1016/j.ijnurstu.2022.104429

Lyles, C. R., Schillinger, D., & Sarkar, U. (2023). Digital communication technologies and therapeutic alliance in diabetes care. *Diabetes Technology & Therapeutics, 25*(1), 14–21. https://doi.org/10.1089/dia.2022.0267

Liu, Y., Chen, Y., & Yang, X. (2022). Impact of mobile-based digital communication on diabetes self-management: A meta-analysis. *Journal of Medical Internet Research, 24*(3), e34618. https://doi.org/10.2196/34618

Lufthiani, & Karota, E. (2019). Efektifitas pendampingan: konseling kesehatan terhadap pengendalian kadar gula darah pada klien dengan diabetes melitus. *Jurnal Ilmu Keperawatan Jiwa*, *2*(3), 129–138. https://journal.ppnijateng.org/index.php/jikj/article/view/390

Meiriana, A., Trisnantoro, L., & Siwi Padmawati, R. (2019). Implementasi program pengelolaan penyakit kronis (prolanis) pada penyakit hipertensi di puskesmas jetis kota yogyakarta. *Jurnal Kebijakan Kesehatan Indonesia*, *08*(02), 51–58. https://jurnal.ugm.ac.id/jkki/article/view/37546

Ng, J. Y. Y., Lee, P. C., & Wong, F. K. (2023). Diabetes knowledge and self-care behaviors among adult patients with type 2 diabetes mellitus: A meta-analysis. *Patient Education and Counseling, 106*(1), 37–47. https://doi.org/10.1016/j.pec.2022.08.018

Osei-Assibey, G., Meier, M., & de Winter, A. F. (2021). The impact of sugar taxation on health outcomes and inequalities: A scoping review. *Public Health Nutrition, 24*(9), 2766–2780. https://doi.org/10.1017/S1368980020004139

Putri, A. (2017). Kesiapan Sumber Daya Manusia Kesehatan

Dalam Menghadapi Masyarakat Ekonomi Asean (MEA). *Jurnal Medicoeticolegal Dan Manajemen Rumah Sakit*, *6*(1), 55–60. https://doi.org/10.18196/jmmr.6127

Rachmawati, U., Sahar, J., & Wati, D. N. K. (2019). The association of diabetes literacy with self-management among older people with type 2 diabetes mellitus: A cross-sectional study. *BMC Nursing*, *18*(Suppl 1), 1–8. https://doi.org/10.1186/s12912-019-0354-y

Rante, A. (2020). Hubungan beban kerja dengan kinerja perawat di puskesmas walenrang kabupaten luwu tahun 2017. *Jurnal Lontara Kesehatan*, *1*(1). https://journal.akpersawerigading.ac.id/index.php/lontara/article/view/lontara.v1i1.13/8

Reeves, S., Pelone, F., Harrison, R., Goldman, J., & Zwarenstein, M. (2021). Interprofessional collaboration to improve diabetes care: A systematic review and meta-analysis. *Medical Care Research and Review, 78*(2), 113–141. https://doi.org/10.1177/1077558720903120

Rohayani, L., Inayah, I., Shofiyani Shoumi, A., Pragholapati, A., & Jenderal Achmad Yani, Stik. (2020). Pelayanan Prima Perawat Berdasarkan Persepsi Pasien di Ruang Rawat Inap Talaga Bodas (Penyakit Dalam Pria Kelas 3) Rumah Sakit Tingkat II 03.05.01 Dustira Cimahi 2019. In *Journal Of Health Science (Jurnal Ilmu Kesehatan)* (Vol. 5, Issue 1). https://doi.org/10.24929/JIK.V5I1.935

Rusnoto, Chandiq, N., & Winarto. (2017). Pengetahuan dan kepatuhan kontrol gula darah sebagai pencegahan ulkus diabetikum. *URECOL*, 513–520. http://journal.ummgl.ac.id/index.php/urecol/article/view/1857

Seidu, S., Cos, X., Brunton, S., Harris, S. B., Jansson, S. P. O., Mata-Cases, M., Neijens, A. M. J., Topsever, P., & Khunti, K. (2022). 2022 update to the position statement by Primary Care Diabetes Europe: a disease state approach to the pharmacological management of type 2 diabetes in primary care. *Primary Care Diabetes*, *16*(2), 223–244. https://doi.org/10.1016/J.PCD.2022.02.002

Sujana, T., Retno Triandhini, R. L. N. K., & Sanggaria, O. A. (2019). Peran Puskesmas Dalam Identifikasi Dini Penyakit Diabetes Melitus Pada Lansia. *Jurnal Ilmu Ilmu Keperawatan*, *19*.

Timpel, P., Harst, L., Reifegerste, D., Weihrauch-Blüher, S., & Schwarz, P. E. H. (2019). What should governments be doing to prevent diabetes throughout the life course? *Diabetologia*, *62*(10), 1842–1853. https://doi.org/10.1007/S00125-019-4941-Y/METRICS

Tristiningdyah, D. (2016). Pengaruh perawatan luka di rumah terhadap kecemasan pada pasien ulkus diabetes melitus di wilayah puskesmas toroh. *The Shine Cahaya Dunia*, *1*(1). http://ejournal.annurpurwodadi.ac.id/index.php/TSCD3Kep/article/view/99/114

Valverde, M., Isla, P., Jansà, M., & Moncho, J. (2021). Endocrinología, Diabetes y Nutrición Development of the professional role of diabetes nurses in specialised diabetes and primary care in Catalonia PALABRAS CLAVE. *Endocrinol Diabetes Nutr*, *68*(1), 53–65. https://doi.org/10.1016/j.endinu.2019.11.011

Wahyuningsih, S., Herwanto, Y., & Kusuma, D. (2021). Challenges in delivering group-based diabetes management programs in Indonesia: A qualitative study. *BMC Health Services Research, 21*(1), 1085. https://doi.org/10.1186/s12913-021-07143-x

White, E. M., Aiken, L. H., & McHugh, M. D. (2019). Registered Nurse Burnout, Job Dissatisfaction, And Missed Care In Nursing Homes. *Journal of the American Geriatrics Society*, *67*(10). https://doi.org/10.1111/jgs.16051

Widodo. (2014). Monitoring of patient with diabetes mellitus. *Jurnal Ilmiah Kedokteran Wijaya Kusuma*, *3*(2), 55–69. https://journal.uwks.ac.id/index.php/jikw/article/view/23/23

Yang, Y., Li, X., & Lu, Y. (2022). Social support and physical activity interventions to improve glycemic control in type 2 diabetes: A systematic review. *Diabetes Research and Clinical Practice, 183*, 109123. https://doi.org/10.1016/j.diabres.2021.109123

Yanti, I., & Bahri, T. S. (2018). Aktivitas fisik pasien diabetes mellitus tipe 2 dalam mengontrol kadar glukoda darah. *Jurnal Ilmiah Mahasiswa Fakultas Keperawatan*, *3*(1). http://jim.unsyiah.ac.id/FKep/article/view/6110/0

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