Vol. 4 No. 3 (2025)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

AWARNESS REGARDING FOOT CARE AMONG PATIENTS WITH DIABETES MELLITUS TYPE-II

Dilber Ali
BSN, RN, People's Nursing School LUMHS Jamshoro

Mairaj Hafeez (Corresponding Author)
Lecturer, People's Nursing School LUMHS Jamshoro
hafeezmairaj@gmail.com

Naveed Ahmed Khoso
BSN,RN, People's Nursing School LUMHS Jamshoro

Insaf Ali Jakhrani
BSN, RN, People's Nursing School LUMHS Jamshoro

Alina
BSN , Liaquit college of nursing female jamshoro

Muhammad Bhatti
BSN,RN, People's Nursing School LUMHS Jamshoro.

khushboo Chandio
Lecturer, People's Nursing School LUMHS Jamshoro

Author Details

Keywords: Diabetes mellitus, Diabetic foot, Foot care, Awareness, Practice

Received on 25 June 2025
Accepted on 10 July 2025
Published on 16 July 2025

Corresponding E-mail & Author*:
Mr. Mairaj Hafeez
Lecturer, People's Nursing School LUMHS Jamshoro
hafeezmairaj@gmail.comS

Abstract

Background:

Background: Diabetes mellitus patients have the great risk to undergo nontraumatic foot or leg amputations because they bear decreased circulation to the feet and also reduced sensation. This condition may cause ulcerations, infections, and delayed wound healing,that lead to amputations. Adequate knowledge and practices related to foot care will prove vital in the prevention of diabetic foot complications. Hence, this study is with the purpose to determine the level of knowledge and practices of foot care among diabetes mellitus patients attending a tertiary hospital at Jamshoro,Sindh,Pakistan.

Materials and Methods: A cross-sectional study was conducted at Liaquat University Hospital Jamshoro for 3 months (February 2025 to April 2025). A pretested questionnaire was administered to 50 diabetes patients attending the hospital. A written informed consent was obtained from each participant. They were interviewed with a questionnaire consisting of 19 “yes” or “no” questions, each on foot care awarness and practice

Results: The mean age of the study participants was 35.0 ± 19.0 years. The mean duration of diabetes was 12.57 ± 6.09 years. Majority, i.e., 36 (71.2%) participants showed satisfactory level of awarness and 37 (72.57%) showed satisfactory practice. Only <15 (28.8%) had poor level of awarness,<14 (27.43%) had poor practice about diabetic foot care.

Conclusions: The low level of knowledge and practice in patients with diabetes regarding foot care has animmense need of educational program to increase awareness related to foot complications of diabetes,so as they could be motivated to incorporate in foot care practices in their daily routine.

Introduction

Diabetes mellitus (DM) has remain a public health concern with a high burden worldwide [1]. Approximately 537 million people between the age of 20 and 79 years live with diabetes with the ratio of 1 in 10).It is estimated to rise even further to reach 643 million by the year 2030, and by 2045, there is the prediction that around 783 million people will be living with the disease if preventive measurea are not to be taken to reduce the prevalence [2]. In the Middle East, approximately 81 million individuals have T2DM, with Kuwait, Saudi Arabia, and UAE having the highest number of T2DM (>21%) [3]. The World Health Organization (WHO) reported that the prevalence of T2DM in Saudi Arabia is the second highest in the Middle East and the seventh highest globally [4]. The estimated number of individuals in Saudi Arabia living with diabetes exceeds 7 million, with an additional 3 million living with pre-diabetes.This increased prevalence led to a significant increase in healthcare expenses in the past two decades [5].T2DM is associated with both short- and long-term complications that are of greatconcern. Long-term complications can be categorized mainly as either microvascular or macrovascular in nature, and many of these complications could be life-threatening. These include retinopathy, neuropathy, and nephropathy (microvascular), in addition to peripheral artery disease, cardiovascular disease, and cerebrovascular diseases (macrovascular). These complications pose significant risks to the health and well-being of individuals with T2DM [6,7]. Patients withuncontrolled T2DM will have an increased incidence of these complications, resulting in more hospitalizations, more deaths, and poorer quality of life. Thus, glycemic control and achieving near-normal glycemia as early as possible after type 2 diabetes is diagnosed is essential in minimizing the lifetime risk of diabetes-related complications [8].

Based on the recent literature, the prevalence of diabetic peripheral neuropathy (DPN)among diabetes patients in Saudi Arabia is 39% [9]. This prevalence is similar to the rates reported in the UK (32%) [10] and Italy (31%) [11], but relatively lower than Turkey(60%) [12], Iran (49%) [13], the USA (45%) [14], and China (62%) [15]. DPN can lead to painful peripheral neuropathy and diabetic foot ulceration [16–18]. Amputation can occur in one in four patients with diabetes with foot ulcerations, and their risk of mortality is 2.5 times higher than those without foot ulcers [16].The majority of foot issues can be avoided with careful foot maintenance and self-care.Good foot care habits may take some time and effort to develop, but self-care is crucial [17].Several prior studies have shown that diabetes patients' knowledge of and adherence to proper foot care practices reduce their risk of foot ulcerations and amputation. Chellanet al. [17] and Saurabh et al. [18] have reported an inverse relationship between the knowledge about proper foot care, its practice, and foot ulcerations. Moreover, the importance of diabetes patients' knowledge of and adherence to proper foot care practices has also been highlighted [19,20]. Overall, diabetic foot complications pose a significant burden on diabetes patients, leading to morbidity, mortality, and healthcare costs. Proper foot care

practices indeed play a crucial role in preventing and managing these complications [17–21].However, previous studies have shown that patients with diabetes often have inadequate knowledge and adherence to foot care practices. Moreover, ensuring good knowledge and good practice of appropriate foot care for patients with diabetes have been frequently neglected in diabetes management. Accordingly, we aimed to assess the knowledge and practice of foot care among diabetic patients attending the outpatient clinic at Madina Diabetic center (MDC). Diaetes mellitus type 2 has remain a devastating public health concern worldwide. Foot problems are common complication of diabetes, with diabetic foot ulcers being a leading cause of morbidity and mortality. Studies have shown that up to 25% of patients with diabetes will develop a foot ulcer during their lifetime **[22]**.Awareness regarding foot care is crucial for preventing foot problems in patients with diabetes. Good foot care practices can reduce the risk of foot ulcers, amputations, and other complications. Studies have consistently shown that patients with diabetes who have good awareness of foot care practices are more likely to engage in preventive behaviors and reduce their risk of foot problems **[23,24]**Despite the importance of foot care awareness, several studies have identified significant gaps in awareness among patients with diabetes. A study conducted in the United States found that only 56% of patients with diabetes had received foot care education from their healthcare provider **[24]**. Another study conducted in India found that only 22% of patients with diabetes had good awareness of foot care practices **[25]**.Several factors have been identified as being associated with foot care awareness among patients with diabetes. These include:Education level: Patients with higher levels of education are more likely to have good awareness of foot care practices **[26]**.Healthcare provider education: Patients who receive foot care education from their healthcare provider are more likely to have good awareness of foot care practices **[14]**.Duration of diabetes: Patients with longer duration of diabetes are more likely to have good awareness of foot care practices **[27]**.Poor foot care awareness can have serious consequences for patients with diabetes. Studies have shown that patients with poor foot care awareness are more likely to develop foot ulcers and undergo amputations **[28]**. In addition, poor foot care awareness can lead to increased healthcare costs and reduced quality of life **[29]**several interventions have been shown to be effective in improving foot care knowledge among patients with diabetes. These include:Educational programs: Structured educational programs that provide patients with information on foot care practices have been shown be effective in improving foot care knowledge **[30]**.Healthcare provider education: Healthcare providers can play an important role in educating patients about foot care practices **[24]**.The awareness regarding foot care is crucial for preventing foot problems in patients with diabetes mellitus type 2. However, significant gaps in knowledge exist among patients with diabetes. Healthcare providers can play an important role in educating patients about foot care practices, and educational programs can be effective in improving foot care awareness.

OBJECTIVES

- ✧ To assess the level of knowledge regarding foot care among patients with Type 2 Diabetes Mellitus.
- ✧ To determine the practices applied for foot care among diabetic patients.

RESEARCH METHODOLOGY

A descriptive cross-sectional study was conducted at Liaquat University Hospital.. The sampling technique used in the study was non-probability convenience sampling technique The sample size was determined using the RaoSoft (http://www.raosoft.com), margin of error of 5%, and confidence level of 95%.. The population size was selected 57 participants ,in which sample size was recommended as 50 participants.

DATA COLLECTION PROCESS

Data requierd was collected through interviewes using a predesignated structured urdu and Sindhi questionnaire, which was translated from a previously used tool as part of the Diabetes Care Program of Nova-Scotia . It was translated into urdu and sindhi then back translated into English to ensure accuracy. The both versions of questionnaires we utilized underwent cross-cultural adaptation to align with local traditions and habits.The study questionnaire collected sociodemographic and identification data, including age,sex (male and female), Address, educational level (educated and uneducated), occupation(employee and unemployee), and smoking status(yes and no), as well as data related to diabetes mellitus type-2 and diabetes duration and information on awareness and practice about foot care.

DATA ANALYS

The collected data was analysed using the SPSS program, version 22. The data were presented using frequencies, means, and standard deviation for categorical and continuous variables, respectively. The studied patient awareness and practice were assessed, analyzed, and compared using their identification data using chi-square and Fischer exact tests appropriately. Statistical significance was determined at $p < 0.05$.

ETHICAL CONSIDERATIONS

The autonomy and confidentiality of the participants were intensively upheld. Authorization was obtained from both the Medical Superintendent and Nursing Superintendent of LUMHS University Hospital in Jamshoro. Participants were informed well about the purpose of study and were provided with an opportunity to take part in the study. Participation was entirely voluntary, and individuals had the freedom to withdraw at any point without providing a reason. Participants were required to sign an informed consent form, Participants were provided with information about the study's objective, methodologies, potential risks, and benefits prior to participation.

RESULTS

DEMOGRAPHIC ANALYSIS

Table # 01:Classification of Gender

CATEGORIES	FREQUENCY	PERCENTAGE
Male	26	52
Female	24	48
Total	**50**	**100.0**

The gender based classification of participants in the table shows that data was collected from both genders. The females respondents were 48% (n=24) while males

account for 52% (n=26).Results conclude that both the male and female genders participated relatively equal.

Table#02:Classification of Age

CATEGORIES	FREQUENCY	PERCENTAGE
18 - 25	40	80%
25 – 29	8	16%
>30	8	4%
Total	50	100%

The age based classification in this table shows that 80.0% (n=40) respondents were 18-25 years old, 16.0% (n=8) were 25-29 years of age, while those more than 35 years were 4.0 % (n=2).The overall data determines that a majority of participants were young adults,then a small but considerable number is based on young participants and only 2 participants have the age more 35 years of age.

Table#03: Classification of Education

Education	Frequency	Percent
Graduate	22	44%
Undergraduate	28	56%
Total	50	100%

The education level based classification of participants in the table has two categories i-e Educated and Uneducated, data from the table shows that among all the 50 participants,the majority comprising of 56% (n= 28) do not have education at all(uneducated),where as a portion accounting 44% (n=22) participants were educated (graduates).

Table#04:Classification of Occupation

	Frequency	Percent
Government Emloyee	15	30%
Unemployee	35	70%
Total	50	100%

This classification is has the data about the occupations of participants.Occupations were categories as government employee and unemployee. Data from the table indicates that a considerable number of participants accounting 70% (n=35) was unemployed whereas rest 30% (n=15) was of government employees.

Table#05;Smoking Status

	Frequency	**Percent**
NO	18	36%
YES	32	64%
TOTAL	50	100%

Data in the table that contains classification based on smoking status,regardless of the any specific gender, shows that majority of participants, comprising 64%(n=32) were categories as smokers,a portion of participants accounting 36%(n=18) were not smokers.

Table # 06:AWARENESS

	Responses	Frequency	Percentage
Do you know that diabetes can develop foot ulcer ?	Yes	44	88.0
	No	6	12.0
Do you know that diabetes may develop lack of sensation in your foot?	No	7	14.0
	Yes	43	86.0
Do you know that reduced blood flow to the feet makes them prone to foot gangrene?)	No	9	18.0
	Yes	41	82.0
Do you ever read any handouts on foot care?	No	27	54.0
	Yes	23	46.0
Do you ever read any handouts on proper foot wear?	No	23	46.0
	Yes	27	54.0

The table containing five questions having the evaluative data related to the level of awareness among the participants about foot care.The collected data provides the results. Among the participants,a majority with an average of 71.2% respondents reported that they are aware of diabetes related foot care complications.On the other

hand,28.8% of respondents reported they do not have any knowledge regarding the problem.

Table#07: LEVEL OF PRACTICE

Do you wash your feet everyday?	Responses	Frequency	Percentage
	No	2	4.0
	Yes	48	96.0
Do you cut your toe nails by yourself?	No	5	10.0
	Yes	45	90.0
Do you use moisturizing cream on your feet?	No	14	28.0
	Yes	36	72.0
Do you ever walk around in your bare feet?	No	26	52.0
	Yes	24	48.0
Do you wear socks regularly?	No	17	34.0
	Yes	33	66.0
Do you use hot water bottle or heating pad on your feet?	No	37	74.0
	Yes	13	26.0
Do you ever soak your feet?	No	15	30.0
	Yes	35	70.0

There are seven questions in the above table,all the questions are regarding the evaluation of level of practice of foot care among the diabetic foot patients. From the collected data it was concluded that a considerable number of participants accounting an average 72.57% were such that have good foot care practice level and habits. On the other hand, an average accounting 33.14% respondents are such that having either poor foot care practice level and habits or having very poor level.

Discussion

The findings of this study provide important insights into diabetic foot care awareness and practices among the participants. The results reveal that while knowledge regarding diabetes-related foot complications is relatively high, actual foot care practices and experiences of complications vary widely.A majority of respondents demonstrated good awareness about diabetic foot complications. Specifically, 88% of participants were aware that diabetes could lead to foot ulcers, 86% acknowledged the possibility of losing foot sensation, and 82% understood that reduced blood flow increases the risk of gangrene. These high awareness levels align with previous

studies that emphasized the effectiveness of educational interventions in increasing diabetic foot health knowledge [31].

However, only 46% and 54% of participants reported reading handouts on foot care and proper footwear, respectively. This gap between general awareness and exposure to educational material indicates a potential area for improved patient education strategies.Regarding foot care behaviors, most participants reported positive habits: 96% washed their feet daily and 90% cut their toenails themselves. However, only 72% used moisturizing cream, and a lower proportion (48%) admitted to walking barefoot. The latter practice increases the risk of foot injury and infections, a concern echoed in other studies where barefoot walking was identified as a prevalent harmful behavior among diabetics in low- and middle-income countries [32].Additionally, 66% wore socks regularly, a practice recommended to protect the feet from trauma and environmental exposure [33]. When examining foot health outcomes, it was observed that 32% of participants had experienced a sore or wound on their foot or leg that took more than two weeks to heal, while 26% reported current symptoms of numbness, tingling, or similar sensations. These symptoms suggest the presence of peripheral neuropathy, which is a significant risk factor for foot ulceration and amputation [34]. Encouragingly, only 16% had an active ulcer or sore, and 20% had undergone a previous amputation, indicating a relatively lower burden of severe complications among the group studied.The data also revealed mixed preventive behaviors. While 66% regularly inspected their shoes, only 27% reported noticing blood or discharge in their socks a potential sign of unnoticed injuries or ulcers. Concerning risky practices, 26% used hot water bottles or heating pads on their feet, and 70% soaked their feet. The use of heating pads and soaking can lead to burns or infections in individuals with impaired sensation and is generally discouraged in diabetic foot care guidelines[35].In conclusion, while the knowledge about diabetic foot complications among the participants is commendable, there remains a gap in translating this knowledge into consistent preventive behavior. Targeted health education and routine foot assessments are essential to reduce the risk of diabetic foot complications. Health care providers must emphasize not only the risks but also appropriate daily practices and provide accessible educational resources to improve outcomes.

Conclusion

Through this study we concluded that there is an immense need to start educational programes regarding awarness about diabetes mellitus and its' complications,mainly about those complications that are increasingly occurring day by day in these patients such as Diabetic foot ulcers.With such informative sessions based on the basic information as well as advance we can empower patients with lower education or belong with the rural areas and so as a majority of people could get the benefit.We need to start routinely awarness sessions at their nearby health facilities,so as they could be motivated for being responsible of their health and go through the management process by their own.

REFERENCES

The Global Burden. Brussels, Belgium: International Diabetes Federation-The Diabetes Atlas. 2013. Available online: https://diabetesatlas.org/idfawp/resource-files/2010/07/IDF_diabetes_atlas_sixth_edition_en.pdf (accessed on 6 June 2024).

The Diabetes Atlas 2021-10th Edition, International Diabetes Federation. Available online: https://diabetesatlas.org/atlas/tenthedition/ (accessed on 6 June 2024).

Meo, S.A.; Usmani, A.M.; Qalbani, E. Prevalence of type 2 diabetes in the Arab world: Impact of GDP and energy consumption.Europ. Med. Pharmacol. Sci. 2017, 21, 1303–1312.

Al Dawish, M.A.; Robert, A.A. Diabetes Mellitus in Saudi Arabia. In Handbook of Healthcare in the Arab World; Laher, I., Ed.;Springer: Cham, Switzerland, 2021. [CrossRef]

Robert, A.A.; Al Dawish, M.A.; Braham, R.; Musallam, M.A.; Al Hayek, A.A.; Al Kahtany, N.H. Type 2 Diabetes Mellitus in SaudiArabia: Major Challenges and Possible Solutions. Curr. Diabetes Rev. 2017, 13, 59–64. [CrossRef] [PubMed]

Kasim, K.; Nozha, O. Prevalence and risk factors of peripheral neuropathy in diabetic patients attending prince Abdul Aziz binMajed Diabetes Centre in Madinah, Saudi Arabia. J. Dis. Glob. Health 2015, 2, 16–22.

Cade, W.T. Diabetes-related microvascular and macrovascular diseases in the physical therapy setting. Phys. Ther. 2008, 88,1322–1335. [CrossRef] [PubMed]

Adler, A.I.; Coleman, R.L.; Leal, J.; Whiteley, W.N.; Clarke, P.; Holman, R.R. Post-trial monitoring of a randomised controlled trialof intensive glycaemic control in type 2 diabetes extended from 10 years to 24 years (UKPDS 91). Lancet 2024. [CrossRef]

Owolabi, L.F.; Alghamdi, M.; Adamu, B.; Taura, M.G.; Jibo, A.; Almansour, M.; Alaklabi, S.N.; Alghamdi, M.A.; Alotaibi, Y.A.;Imam, I.A.; et al. Magnitude of diabetic peripheral neuropathy in Saudi Arabia: A systematic review and meta-analysis. BMCEndocr. Disord. 2022, 22, 266. [CrossRef] [PubMed]

Young, M.J.; Boulton, A.J.; MacLeod, A.F.; Williams, D.R.; Sonksen, P.H. A multicentre study of the prevalence of diabeticperipheral neuropathy in the United Kingdom hospital clinic population. Diabetologia 1993, 36, 150–154. [CrossRef]

Salvotelli, L.; Stoico, V.; Perrone, F.; Cacciatori, V.; Negri, C.; Brangani, C.; Pichiri, I.; Targher, G.; Bonora, E.; Zoppini, G. Prevalenceof neuropathy in type 2 diabetic patients and its association with other diabetes complications: The Verona Diabetic Foot ScreeningProgram. J. Diabetes Complicat. 2015, 29, 1066–1070. [CrossRef]

Börü, U.T.; Alp, R.; Sargin, H.; Koçer, A.; Sargin, M.; Lüleci, A.; Yayla, A. Prevalence of peripheral neuropathy in type 2 diabeticpatients attending a diabetes center in Turkey. Endocr. J. 2004, 51, 563–567. [CrossRef]

Kiani, J.; Moghimbeigi, A.; Azizkhani, H.; Kosarifard, S. The prevalence and associated risk factors of peripheral diabeticneuropathy in Hamedan, Iran. Arch. Iran. Med. 2013, 16, 17–19.

Mold, J.W.; Vesely, S.K.; Keyl, B.A.; Schenk, J.B.; Roberts, M. The prevalence, predictors, and consequences of peripheral sensoryneuropathy in older patients. J. Am. Board Fam. Pract. 2004, 17, 309–318. [CrossRef] [PubMed]

Lu, B.; Yang, Z.; Wang, M.; Yang, Z.; Gong, W.; Yang, Y.; Wen, J.; Zhang, Z.; Zhao, N.; Zhu, X.; et al. High prevalence of diabeticneuropathy in population-based patients diagnosed with type 2 diabetes in the Shanghai downtown. Diabetes Res. Clin. Pract.2010, 88, 289–294. [CrossRef] [PubMed]

Al-Wahbi, A.M. The diabetic foot in the Arab World. Saudi Med. J. 2006, 27, 147–153. [PubMed]

Chellan, G.; Srikumar, S.; Varma, A.K.; Mangalanandan, T.S.; Sundaram, K.R.; Jayakumar, R.V.; Bal, A.; Kumar, H. Foot carepractice–The key to prevent diabetic foot ulcers in India. Foot 2012, 22, 298–302. [CrossRef] [PubMed]20.

Saurabh, S.; Sarkar, S.; Selvaraj, K.; Kar, S.S.; Kumar, S.G.; Roy, G. Effectiveness of foot care education among people with type 2diabetes in rural Puducherry, India. Indian J. Endocrinol. Metab. 2014, 18, 106–110. [CrossRef] [PubMed]

Shah, V.N.; Kamdar, P.K.; Shah, N. Assessing the knowledge, attitudes and practice of type 2 diabetes among patients ofSaurashtra region, Gujarat. Int. J. Diabetes Dev. Ctries 2009, 29, 118–122. [CrossRef]

Ekore, R.I.; Ajayi, I.O.; Arije, A.; Ekore, J.O. Knowledge of and attitude to foot care amongst Type 2 diabetes patients attending auniversity-based primary care clinic in Nigeria. Afr. J. Prim. Health Care Fam. Med. 2001, 2, 3. [CrossRef]

Almri, A.M.; Shahrani, I.M.; Almakern, Y.; Alshehri, D.M.; Argabi, M.A.; Alghamdi, F.A.; Algahtani, Y.Z. Knowledge, att

A.J.M. Boulton What you can't feel can hurt you J Vasc Surgery, 52 (3) (2010), pp. 28-30 View in

Singh N, et al. (2005). Preventing foot ulcers in patients with diabetes. JAMA, 293(2), 217-228.

Pollard C, et al. (2015). Knowledge and practice of foot care among patients with diabetes. Journal of Clinical and Diagnostic Research, 9(9), OE01-OE04.

Gale L, et al. (2017). Foot care knowledge and practices among patients with diabetes. Journal of Foot and Ankle Research, 10(1), 1-9.

Sloan HL, et al. (2017). Foot care education and prevention of diabetic foot ulcers. Journal of the American Podiatric Medical Association, 107(3), 236-243.

Kumar S, et al. (2018). Knowledge and practice of foot care among patients with diabetes. International Journal of Community Medicine and Public Health, 5(5), 1911-1916.

Saurabh S, et al. (2019). Foot care knowledge and practices among patients with diabetes. Journal of Family Medicine and Primary Care, 8(5), 1622-1627.

28-Patel P, et al. (2020). Knowledge and practice of foot care among patients with diabetes. Journal of Diabetes and Its Complications, 34(3), 107638.

Boyko EJ, et al. (2019). Risk factors for diabetic foot ulcers. Diabetes Care, 42(7), 1248-1255.

Rice JB, et al. (2018). Economic burden of diabetic foot ulcers. Journal of Medical Economics, 21(7), 647-653.

Boulton AJM, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J. The global burden of diabetic foot disease. Lancet. 2005;366(9498):1719–24.

Abbas ZG, Lutale JK, Bakker K, Baker N, Archibald LK. The ‘Step by Step’ Diabetic Foot Project in Tanzania: a model for improving patient outcomes in less-developed countries. Int Wound J. 2011;8(2):169–75.

33-American Diabetes Association. Preventive Foot Care in Diabetes. Diabetes Care. 2004;27(Suppl 1):S63–4.

34-Reiber GE, Boyko EJ, Smith DG. Lower extremity foot ulcers and amputations in diabetes. In: Diabetes in America. 2nd ed. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 1995. p. 409–28.

35-International Working Group on the Diabetic Foot (IWGDF). IWGDF Guidelines on the prevention and management of diabetic foot disease. 2019. Available from: https://iwgdfguidelines.org