Title

Foot care behaviours among adults with type 2 diabetes

Introduction

Type 2 diabetes mellitus (T2DM) increases the burden on the health care system and has been called an "economical tsunami" (Canadian Diabetes Association, 2009; Somerville, 2009). Nearly 80% of the world's population with T2DM live in developing countries (American Diabetes Association, 2014) and this prevalence is increasing in the Middle East region (International Diabetes Federation, 2013a; Whiting, Guariguata, Weil, & Shaw, 2011; World Health Organization, 2014). The prevalence of T2DM was 22% in 2014 in the Sultanate of Oman (International Diabetes Federation, 2013a; Ministry of Health, 2014). A 190% increase in the number of adults with T2DM has been projected from 75,000 cases in 2000 to 217,000 cases in 2025 in Oman (Al Bimani, Khan, & David, 2013; World Health Organization, 2013). By 2030, the prevalence of T2DM is expected to rise in Oman and this increase in prevalence may be attributed to sedentary lifestyle, urbanization, high calorie diet and low physical activity (Lam & LeRoith, 2012). Some Omani adults lack knowledge and information on foot preventive measures (Al Shafaee et al., 2008).

Background

Foot ulcers are a major complication, occurring in 15% of adults with T2DM (Al-Busaidi, 2014; Al-Lawati, Mabry, & Mohammed, 2008; Al-Shookri, Khor, Chan, Loke, & Al-Maskari, 2011). Inappropriate footwear and improper toenail trimming can increase the risk of developing foot problems. Foot syndromes like neuropathy, ischemia and infection can result in morbidity and possible amputation (American Diabetes Association, 2014; World Health Organization, 2014). An estimated 15%-25% of adults with T2DM develop foot ulcers during their lifetime, and up to 70% of all non-traumatic amputations in the world are considered a complication of diabetes (International Diabetes Federation, 2013b). Amputation can lead to severe adverse effects including high financial burden, physical disability and high morbidity. Quality of life (QOL) among adults with foot syndrome is significantly affected, with increased dependence on medical care, worsening pain and discomfort, limited physical functional status, and poor work capacity (Zeleníková, Bužgová, Janíková, & Jarošová, 2014). Improving foot care behavior is an effective strategy in minimizing subsequent foot complications (Kurniwawan, Sae-Sia, Maneewat, & Petpichetchian, 2011; Perrin, Swerissen, & Payne, 2009). Understanding the demographic and clinical characteristics influencing foot care behaviours (FCB) among adults with T2DM are helpful to reduce foot problems.

Theory

Self-efficacy regulates how people feel, think, motivate themselves, and practice self-care behaviours; a key factor of confidence to perform a given behavior (Bandura, 1982; Bussey & Bandura, 1999) This confidence is the end result of cognitive processes that people use when acquiring knowledge, the factors that affect it (Liu et al., 2013; Yoo, Kim, Jang, & You, 2011), influence of self-care behaviours on foot care (Desalu et al., 2011; Zeleníková, et al., 2014). In

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this study, understanding factors related to foot care behaviours among the Arab adults is important to design foot care behavioral interventions (Figure 1). The self-efficacy model in this study describes the adult person as a whole in terms of demographic and clinical characteristics. Behavior refers to the actual actions related to foot care behaviours. Outcome expectations include physical like foot problems, body mass index (BMI), fasting blood glucose (FBS), and glycosylated haemaglobin (HbA1c). There are no reported studies on foot care behaviours among adults with T2DM in Oman; therefore, this study is useful to plan strategies to prevent foot problems among adults with T2DM. In this study, the factors related to foot care behaviours among adults with T2DM in Oman were specifically examined.

Aim
The aim of the study was to examine the demographic and clinical characteristics influencing foot care behaviours among Omani adults with T2DM.

Material and Methods
Design
A descriptive cross-sectional design was used for the study.

Population and Setting
Adults with T2DM attending the diabetes clinics in a selected public hospital in Oman were included in the sampling framework. These adults had been assessed for their eligibility for inclusion in the study in the year 2014.

Sample size and sampling criteria
A total of 160 adults with T2DM were necessary to realize 80% power to identify a medium effect size ($f = 0.25$), at the 5% level of significance (α) with an standard deviation of 1% using multiple regression (Amsberg et al., 2009). One hundred sixty adults were selected by systematic random sampling. Inclusion criteria included adults aged 18 to 80 years with T2DM for at least two years, ability to provide self-care; and ability to understand and communicate in Arabic or English language. Adults newly diagnosed with T2DM or type 1 diabetes with a cognitive/ speech impairment, attention deficit, mental or physical challenges or disability, and inability to mobilize were excluded from the study.

Measurements
Based on the conceptual framework and aims of the study, the following measurements were used in the self-efficacy model (Figure 1).
Person was measured as demographic and clinical characteristic. Demographic characteristics included age, gender, formal education, and income. Clinical characteristics included duration of diabetes, diabetes patient education, medications, prevention of activities of daily living (ADL), understanding of diabetes and management and attitude towards DM (ability to fit diabetes into

life in a positive manner). Diabetes Knowledge Test (DKT) was developed and validated by the Michigan Diabetes Research and Training Centre (Fitzgerald et al., 1998). DKT has 23 multiple choice questions with 4-5 options on diet, blood glucose testing, physical activity, medical treatment, complications, foot care, manifestations, sick days, and medication. The correct answers were scored 1 for each item and the total score was summed up. The total DKT scores were classified into poor (0-11) and excellent (12-23). Higher scores of an individual indicate greater knowledge about diabetes than those individuals who score lower on the instrument.

Efficacy expectations was measured as perception of foot care behaviours (FCB). The Diabetes Foot Care Questionnaire (DFQ) was used to measure the foot care behaviours (Abbott et al., 2002) DFQ consist of a 33-items checklist ('yes' and 'no' responses) with 7 subsections like history of foot problems (3 items), current foot/ leg problems (5 items), foot care (7 items), foot safety and prevention (10 items), foot wear (3 items), foot care education (4 items), and current physical activity (1 item). The negative items (e.g. history/ current foot problems, heating pad, smoking, legs crossed, bare feet, shoes without socks, no exercise) were scored '0' and positive statements were given scored '1'. The total DFQ scores were summed and classified into poor (<15) and good (16-33) foot care behaviors (FCB). A higher score indicate higher foot care behaviours among adults with T2DM. In this study, the reliability of the DFQ tool was 0.76.

Outcome expectations were measured as BMI, FBS, HbA1c, duration of diagnosis, diabetes patient education, glycosylated hemoglobin (HbA1c), prevention of activities of daily living, understanding DM and management and attitude towards DM. The treatment goal for HbA1c is less than 6.5% for 'healthy/normal', <7% as 'good to excellent', and < 8% for 'less healthy/fair' for most adults with T2DM (American Diabetes Association, 2014).

Data collection procedure
Participants were diagnosed with T2DM by the physician and were potentially eligible for the study. These participants were provided study information and informed consent. Adults with T2DM who fulfilled the eligibility criteria and signed the informed consent. Participants arrived at the point-of-data collection prior fasting for 6 hours for completion of blood investigations. Data was collected between April-July 2014.

Ethical Considerations
An ethical approval was obtained from the institution ethics and research committee and the hospital board. An informed written consent was obtained from each participant. A letter was provided purposes of the study, human and ethical guidelines, and risks and benefits of participation. Participation and withdrawal from the study was voluntary at any time. Confidentiality was maintained by assigning code numbers, and data were maintained in files secured and locked in the office.

Data analysis
The Statistical Packages for Social Sciences (SPSS) version 20 (IBM, 2011) was used for data entry, cleaning, analysis, and auditing for accuracy. Collinearity checks were done using a correlation matrix and examining Pearson coefficients. Descriptive summaries of means, standard deviations, frequencies and percentages were used. All variables significantly associated with foot care behaviours ($p < 0.05$ level) with ANOVA was entered into a multiple linear regression model to determine the factors influencing foot care behaviours.

Results
A response rate of 87.50% (N=140) was found among the selected adults who participated in the study. Five adults with T2DM had incomplete survey, five adults discontinued from the study, 5 adults were acutely ill and 5 adults moved out of the catchment area.

Demographic and clinical characteristics
Majority of the participants were men (65%). 48.6% of the adults were between 50-59 years (Table 1). The duration of T2DM was 5-10 years (44.3%). Majority of the participants were on oral hypoglycemic medications (72.9%) and less than half percentage of the participants had a BMI above 25 kg/m^2 (41.4%). Most of the participants had a fasting blood glucose (FBS) >7.2mmol/L (90.7%), had a poor HbA1c of > 8% (65%), and poor knowledge of diabetes (73%).

Foot care behaviours
Nearly 15.71% of the participants had a history of foot ulcers, and 41.43% had numbness/ tingling and pain/heaviness in the feet. Majority of the adults with T2DM washed their feet every day (87.86%), while 32.86% had family members who trimmed their toenails (Table 2). Approximately 53.57% of the participants walked bare feet, and 24.29% of them used medication on warts, corns, or callus. Nearly 33.57% of the participants wore special foot wear and shoes, and 25% wore socks. Many of the participants were physically active (73.57%) and 37.86% had foot care education.

Relationship between demographic characteristics and foot care behaviours
History of foot problems were significantly associated with income (Table 3). Physical activity was associated with gender (female), younger age (30-39 and 40-49 years), and education (Bachelor/ Master). Foot care education was associated with income and education. Footwear and Total foot care behaviors was associated with education.

Relationship between clinical characteristics and foot care behaviours
Current foot problems were associated with duration of diabetes (10-15 years), FBS, HbA1c (<6.99%), prevention of activities of daily living, understanding DM and management and attitude towards DM (Table 4). History of foot problems were associated with duration of DM and medication. Foot care was associated with duration of DM, medication, diabetes knowledge, and

attitude towards DM. Foot wear was associated with prevention of activities of daily living, diabetes patient education and attitude towards DM. Foot safety and prevention and physical activity were associated with body mass index (<18.5kg/m2) and prevention of activities of daily living. Physical activity was associated with diabetes patient education. Total foot care behaviours was associated with prevention of activities of daily living, understanding DM and management, and attitude towards DM.

Factors influencing foot care behaviours
In the multivariate analysis, education level (Bachelor/ Master), prevention of activities of daily living and understanding DM and management significantly predicted good foot care behaviours (p<0.05) (Table 5). Higher the education and understanding of DM and lower the prevention of activities of daily living, better the foot care behaviours.

Discussion
This study demonstrated moderate to good foot care behaviours among adults with T2DM attributed to free access to health care, ablution (washing) before prayers, spending more time indoor than outdoor and adapting to extreme heat. It was observed that longer duration of diabetes (10-15 years), low FBS, HbA1c (<6.99%), low prevention of activities of daily living, increased understanding DM and management and attitude towards DM were associated with current foot problems among adults with T2DM.

In this study duration of DM, medication, diabetes knowledge, and attitude towards DM foot care was associated with foot care among adults with T2DM. Other studies show that adults had low knowledge foot care scores and were unaware of inspecting footwear (Jinadasa & Jeewantha, 2011; Rocha, Zanetti, & Santos, 2009; Saleh, Mumu, Ara, Begum, & Ali, 2012). In addition, prevention of activities of daily living, diabetes patient education and attitude towards DM was associated with foot wear. Adults who had positively fit foot care in their daily life (D'Souza, Karkada, Hanrahan, Venkatesaperumal, & Amirtharaj, 2015) and those who had good knowledge had lower HbA1c level (Desalu, et al., 2011). Normal body mass index (<18.5kg/m2) and prevention of activities of daily living was associated with foot safety and prevention among adults with T2DM. Low body mass index, blood glucose, moderate physical activity and dietary intake influenced self-care behaviours (D'Souza, Amirtharaj, Venkatesaperumal, Isac, & Maroof, 2013).

It is apparent women, middle age (30-49 years), higher education (Bachelor/Master), diabetes patient education, normal body mass index (<18.5kg/m2) and prevention of activities of daily living was associated with physical activity. Aging led to changes in the vascular, neurological, and musculoskeletal systems causing high risk of peripheral vascular disease and neuropathy. Younger age, females, higher education, shorter duration of diabetes, and positive attitude to diabetes was significantly associated with foot care (D'Souza, Karkada, Venkatesaperumal, &

Natarajan, 2015) and foot care and controlled HbA1c accounted for 78%, and 51% variances respectively (D'Souza, Karkada, Hanrahan, Venkatesaperumal, & Amirtharaj, 2015). Men have been found to be at a higher risk for foot ulcers than women (Elshenawie, Ahmed Shalan, & Aziza, 2013). Women, older adults (> 75 years), and occurrence of foot ulcers correlated with poor QOL domain scores (Desalu, et al., 2011). Higher proportion of women and those educated had higher FCB like checking, washing and drying feet was better than inspecting interior of shoe (Chourdakis, Kontogiannis, Malachas, Pliakas, & Kritis, 2014).

In this study income and education were associated with foot care education. Education, knowledge and foot care practices (Gholap & Mohite, 2013) are risk factors of foot self-care behaviours. Adherence to self-care and formal education had higher knowledge (Hasnain & Sheikh, 2009; Perrin, et al., 2009). Low education and foot care knowledge, not washing or inspecting feet and foot wear and non-use of foot wear were at risk of foot ulcers (Khamseh, Vatankhah, & Baradaran, 2007). In this study income, duration of DM and medication was associated with history of foot problems. Poor education, knowledge and low socioeconomic status impact low foot care knowledge (Bartolo, Mizzi, & Formosa, 2013; Desalu, et al., 2011; Hamedan, Hamedan, & Torki, 2012; Kafaie, Noorbala, Soheilikhah, & Rashidi, 2012).
In this study education, prevention of activities of daily living, understanding DM and management, and attitude towards DM were significantly associated with total foot care behaviours. Women with higher education and ability to manage diabetes positively; while higher age, prevention of ADL, and knowledge/ management of diabetes were significant with health state among women (D'Souza & Nairy, 2008; D'Souza, Venkatesaperumal, Ruppert, Karkada, & Jacob, 2015) and foot care beliefs in Iran (Hamedan, et al., 2012). Drying between toes, cutting nails along the toe tip and appropriate foot wear reduced foot ulcers (Iunes et al., 2014).

In this study education, prevention of activities of daily, and understanding DM and management predicted good foot care behaviours in the self-efficacy model. Poor education status, diabetes awareness and care was associated with poor foot care while blood glucose monitoring and compliance to diet improved foot care (Saurabh et al., 2014). This finding is consistent with studies showing moderate level of activities of daily living, ability to manage diabetes, average knowledge of diabetes (D'Souza, Venkatesaperumal, Nairy, & Amirtharaj, 2013), and lack of knowledge increased the risk of foot ulcers (Armstrong et al., 2007; Desalu, et al., 2011). Frequency of self-monitoring of blood glucose decreased and inconsistent timing of dietary existed with poor knowledge (Saleh, et al., 2012). Level of knowledge was influenced by education, duration of DM and advice on foot care (Chiwanga & Njelekela, 2015). Low level of education have less access to health care, inappropriate foot wear lead to plantar pressure and foot injuries (International Working Group on the Diabetic Foot, 2007; Smanioto, Haddad, & Rossaneis, 2014). Hence adults with T2DM have to adapt to daily foot care behaviours which depends on education, understanding DM and management and attitude towards DM.

Limitations. Measures of foot self-care behaviours were obtained from self-reported questionnaires with the possibility of response and recall bias. Prospective studies with larger sample sizes may be needed to explore the sources of efficacy expectations, socio-cultural factors, and outcome expectations that affect foot care behaviours.

Conclusion

Good foot care behaviours was observed among 82% of the adults with T2DM. Foot problems are influenced by duration of DM, medications, BMI, FBS and HbA1c, knowledge and patient education. Age, income, education and foot care education self-efficacy in foot care, foot wear, foot safety and prevention and physical activity. Among these FCB, three major predictors education, understanding DM and management and attitude towards DM directly influenced better FCB. This study emphasizes that these predictors influence FCB which are inevitable to low-risk adults with T2DM. Factors influencing poor foot care behaviours were non-adherence to medications, high BMI, HbA1c, poor diabetes knowledge and diabetes patient education. Education, prevention of ADL and understanding of DM are a key component of good FCB proactively, thus reducing the likelihood of foot complications and prevention of foot injuries. The study recommends reinforcing foot care education on foot care, foot safety and prevention, foot wear and exercise.

Implications

This study recommends desirable foot care behaviours like understanding of management, improved activities of living, and self-efficacy based on socio-cultural, family and individual preferences. Continuous foot care education can be integrated to improve foot care behaviours, safety and prevention with a focus on cognitive and behavioral skill change. Nurses in ambulatory foot clinics should assess willingness among adults to adopt best foot care approaches and adherence to foot self-care behaviors. Interprofessional collaborative practice with a nurse educator, a podiatrist, a physical therapist, an occupational therapist, a physician, a dietician, a pharmacist, and a social worker is recommended for designing appropriate foot care interventions among adults with T2DM.

References APA

Abbott, C., Carrington, A., Ashe, H., Bath, S., Every, L., Griffiths, J., . . . Johnson, K. (2002). The North-West Diabetes Foot Care Study: incidence of, and risk factors for, new diabetic foot ulceration in a community-based patient cohort. *Diabetic Medicine, 19*(5), 377-384.

Al-Busaidi, I. S. (2014). *Quality of Diabetic Foot Care in Oman.* University of Otago.

Al-Lawati, J. A., Mabry, R., & Mohammed, A. J. (2008). Addressing the threat of chronic diseases in Oman. *Prev Chronic Dis, 5*(3), A99.

Al-Shookri, A., Khor, G. L., Chan, Y. M., Loke, S. C., & Al-Maskari, M. (2011). Type 2 diabetes in the sultanate of Oman. *Malaysian journal of nutrition, 17*(1), 129-141.

Al Bimani, Z. S., Khan, S. A., & David, P. (2013). Evaluation of T2DM related knowledge and practices of Omani patients. *Saudi Pharmaceutical Journal*.

Al Shafaee, M. A., Al-Shukaili, S., Rizvi, S. G., Al Farsi, Y., Khan, M. A., Ganguly, S. S., . . . Al Adawi, S. (2008). Knowledge and perceptions of diabetes in a semi-urban Omani population. *BMC Public Health, 8*(1), 249.

American Diabetes Association. (2014). American Diabetes Association Diagnosis and classification of diabetes mellitus. *Diabetes Care, 37*(Supplement 1), S81-S90.

Amsberg, S., Anderbro, T., Wredling, R., Lisspers, J., Lins, P.-E., Adamson, U., & Johansson, U.-B. (2009). A cognitive behavior therapy-based intervention among poorly controlled adult type 1 diabetes patients—a randomized controlled trial. *Patient education and counseling, 77*(1), 72-80.

Armstrong, D. G., Holtz-Neiderer, K., Wendel, C., Mohler, M. J., Kimbriel, H. R., & Lavery, L. A. (2007). Skin temperature monitoring reduces the risk for diabetic foot ulceration in high-risk patients. *The American journal of medicine, 120*(12), 1042-1046.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American psychologist, 37*(2), 122.

Bartolo, P., Mizzi, S., & Formosa, C. (2013). An evaluation of foot care behaviours in individuals with type 2 diabetes living in Malta. *Journal of Diabetes Nursing, 17*(2).

Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological review, 106*(4), 676.

Canadian Diabetes Association. (2009). Diabetes Care Program of Nova Scotia. Foot Risk Assessment Form: September.

Chiwanga, F. S., & Njelekela, M. A. (2015). Diabetic foot: prevalence, knowledge, and foot self-care practices among diabetic patients in Dar es Salaam, Tanzania–a cross-sectional study. *Journal of foot and ankle research, 8*(1), 20.

Chourdakis, M., Kontogiannis, V., Malachas, K., Pliakas, T., & Kritis, A. (2014). Self-Care Behaviors of Adults with Type 2 Diabetes Mellitus in Greece. *Journal of community health, 39*(5), 972-979.

D'Souza, M. S., Karkada, S. N., Hanrahan, N. P., Venkatesaperumal, R., & Amirtharaj, A. (2015). Do perceptions of empowerment affect glycemic control and self-care among adults with type 2 diabetes? *Global journal of health science, 7*(5), 80.

D'Souza, M. S., Amirtharaj, A., Venkatesaperumal, R., Isac, C., & Maroof, S. (2013). Risk-assessment score for screening diabetes mellitus among Omani adults. *SAGE Open Medicine, 1*, 2050312113508390.

D'Souza, M. S., Karkada, S. N., Hanrahan, N. P., Venkatesaperumal, R., & Amirtharaj, A. (2015). Do Perceptions of Empowerment Affect Glycemic Control and Self-Care Among Adults with Type 2 Diabetes? *Global Journal of Health Science, 7*(5), p80.

D'Souza, M. S., Karkada, S. N., Venkatesaperumal, R., & Natarajan, J. (2015). Self-Care Behaviours and Glycemic Control among Adults with Type 2 Diabetes. *Journal of Nursing and Health Care (JNHC), 2*(1).

D'Souza, M. S., & Nairy, K. S. (2008). Health promoting behaviours and quality of life among adults with diabetes mellitus: Improved after nurse directed intervention. *Nightingale Nursing Times, 3*(12), 17-20.

D'Souza, M. S., Venkatesaperumal, R., Nairy, K. S., & Amirtharaj, A. (2013). Determinants of glycosylated haemaglobin among adults with Type 2 Diabetes Mellitus in Muscat. *Journal of Diabetes and Metabolism, 4*(5).

D'Souza, M. S., Venkatesaperumal, R., Ruppert, S. D., Karkada, S. N., & Jacob, D. (2015). Health Related Quality of Life among Omani Men and Women with Type 2 Diabetes. *Journal of Diabetes Research, 501*, 154834.

Desalu, O., Salawu, F., Jimoh, A., Adekoya, A., Busari, O., & Olokoba, A. (2011). Diabetic foot care: self reported knowledge and practice among patients attending three tertiary hospital in Nigeria. *Ghana medical journal, 45*(2).

Elshenawie, H. A., Ahmed Shalan, W., & Aziza, E. (2013). Effect of Ozone Olive Oil Ointment Dressing Technique on the Healing of Superficial and Deep Diabetic Foot Ulcers. *J Am Sci, 9*, 235-250.

Fitzgerald, J. T., Funnell, M. M., Hess, G. E., Barr, P. A., Anderson, R. M., Hiss, R. G., & Davis, W. K. (1998). The reliability and validity of a brief diabetes knowledge test. *Diabetes Care, 21*(5), 706-710.

Gholap, M. C., & Mohite, V. R. (2013). To assess the knowledge and practice regarding foot care among diabetes patients at Krishna Hospital, Karad. *Indian Journal of Scientific Research, 4*(2), 69-75.

Hamedan, M. S., Hamedan, M. S., & Torki, Z. (2012). Relationship between Foot-Care Self-Efficacy Beliefs and Self Care Behaviors in Diabetic Patients in Iran (2011). *J Diabetes Metab, 3*(220), 2.

Hasnain, S., & Sheikh, N. H. (2009). Knowledge and practices regarding foot care in diabetic patients visiting diabetic clinic in Jinnah Hospital, Lahore. *JPMA. The journal of the Pakistan Medical Association, 59*(10), 687.

IBM. (2011). IBM SPSS Statistics for Windows, Version 20.0: IBM Corp Armonk, NY.

International Diabetes Federation. (2013a). About Diabetes. Retrieved January, 16, 2014, from http://www.idf.org/about-diabetes

International Diabetes Federation. (2013b). *IDF Diabetes Atlas* (6 ed.). Brussels, Belgium: International Diabetes Federation.

International Working Group on the Diabetic Foot. (2007). *International consensus on the diabetic foot*: International Working Group on the Diabetic Foot.

Iunes, D. H., Rocha, C. B., Borges, N. C., Marcon, C. O., Pereira, V. M., & Carvalho, L. C. (2014). Self-Care Associated with Home Exercises in Patients with Type 2 Diabetes Mellitus. *PLoS One, 9*(12), e114151.

Jinadasa, C. V. M., & Jeewantha, M. (2011). SP5-14 A study to determine the knowledge and practice of foot care in patients with chronic diabetic ulcers. *Journal of Epidemiology and Community Health, 65*(Suppl 1), A449-A449.

Kafaie, P., Noorbala, M. T., Soheilikhah, S., & Rashidi, M. (2012). Evaluation of patients' education on foot self-care status in diabetic patients. *Iranian Red Crescent Medical Journal, 14*(12), 829.

Khamseh, M. E., Vatankhah, N., & Baradaran, H. R. (2007). Knowledge and practice of foot care in Iranian people with type 2 diabetes. *International wound journal, 4*(4), 298-302.

Kurniwawan, T., Sae-Sia, W., Maneewat, K., & Petpichetchian, W. (2011). The Effect of A Self-Management Support Program on The Achievement of Goals in Diabetic Foot Care Behaviors in Indonesian Diabetic Patients. *Nurse Media Journal of Nursing, 1*(2), 195-210.

Lam, D. W., & LeRoith, D. (2012). The worldwide diabetes epidemic. *Current Opinion in Endocrinology, Diabetes and Obesity, 19*(2), 93-96.

Liu, Y., Maier, M., Hao, Y., Chen, Y., Qin, Y., & Huo, R. (2013). Factors related to quality of life for patients with type 2 diabetes with or without depressive symptoms - results from a community-based study in China. *Journal of Clinical Nursing, 22*(1/2), 80-88. doi: 10.1111/jocn.12010

Ministry of Health. (2014). World Health Survey: Oman. In D. G. o. P. Department of Research, Ministry of Health Publications (Ed.).

Perrin, B. M., Swerissen, H., & Payne, C. (2009). The association between foot-care self efficacy beliefs and actual foot-care behaviour in people with peripheral neuropathy: a cross-sectional study. *J Foot Ankle Res, 2*(3), 1-8.

Rocha, R. M., Zanetti, M. L., & Santos, M. A. d. (2009). Behavior and knowlege: basis for prevention of diabetic foot. *Acta Paulista de Enfermagem, 22*(1), 17-23.

Saleh, F., Mumu, S. J., Ara, F., Begum, H. A., & Ali, L. (2012). Knowledge and self-care practices regarding diabetes among newly diagnosed type 2 diabetics in Bangladesh: a cross-sectional study. *BMC Public Health, 12*(1), 1112.

Saurabh, S., Sarkar, S., Selvaraj, K., Kar, S. S., Kumar, S. G., & Roy, G. (2014). Effectiveness of foot care education among people with type 2 diabetes in rural Puducherry, India. *Indian journal of endocrinology and metabolism, 18*(1), 106.

Smanioto, F. N., Haddad, M. d. C. F. L., & Rossaneis, M. A. (2014). Self-care into the risk factors in diabetic foot ulceration: cross-sectional study. *Online Brazilian Journal of Nursing, 13*(3), 343-352.

Somerville, R. (2009). An economic tsunami: the cost of diabetes in Canada. *Ottawa, ON: Canadian Diabetes Association*.

Whiting, D. R., Guariguata, L., Weil, C., & Shaw, J. (2011). IDF diabetes atlas: global estimates of the prevalence of diabetes for 2011 and 2030. *Diabetes research and clinical practice, 94*(3), 311-321.

World Health Organization. (2013). Global action plan for the prevention and control of noncommunicable diseases 2013-2020.

World Health Organization. (2014). Global Health Estimates: Deaths by Cause, Age, Sex and Country, 2000-2012. *Geneva, WHO*.

Yoo, H., Kim, C. J., Jang, Y., & You, M. A. (2011). Self-efficacy associated with self-management behaviours and health status of South Koreans with chronic diseases. *Int J Nurs Pract, 17*(6), 599-606.

Zeleníková, R., Bužgová, R., Janíková, E., & Jarošová, D. (2014). Evaluation of quality of life of patients with diabetic foot syndrome in selected health care facilities of Moravian Silesian region.
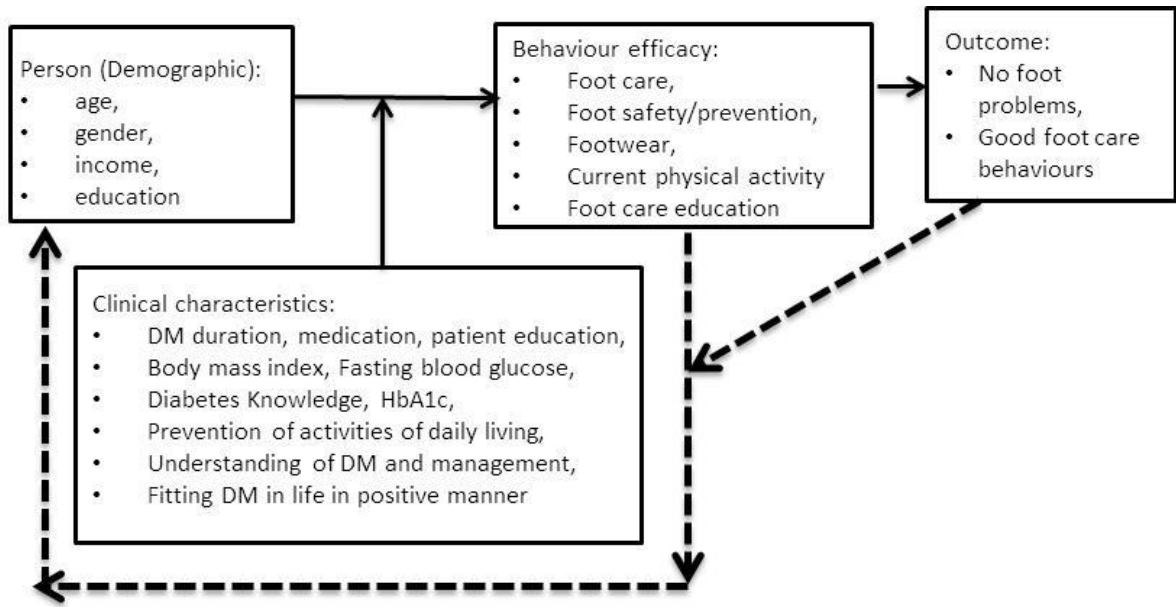
Figure 1. Factors influencing foot care behaviours among adults with T2DM. ➝
Measured in study. Modified Bandura 1977; Shortridge-Baggett & Van der Bijl 1996