Assessment of Risk Factors on the Caregivers of Dementia Patients using REACH-II Risk Appraisal

By

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Brac University
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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing my degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
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Approval

The thesis titled "Assessment of Risk Factors on the Caregivers of Dementia Patients using REACH-II Risk Appraisal" submitted by Tanjila Nasrin Snigda (20346016), of Summer, 2024 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy.

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Ethics Statement

This research was conducted with strict adherence to ethical standards, ensuring the integrity and credibility of the study. No human trials or animal subjects were involved. All data were collected and reported with integrity and transparency, complying with relevant ethical guidelines and regulations.

Abstract

Caring for dementia patients often creates mental, physical and emotional challenges leading to stress, depression and burden among the caregivers. This study estimated the REACH-II Risk Appraisal which is a structured intervention and designed to assess caregiver stress, burden, health behaviors, social support and coping mechanisms. Through the analysis of the risk factors and indicators of wellbeing, this study highlights the effectiveness of REACH-II Risk Appraisal in identifying risk levels of caregivers as well as provide insights of improving their life. The study also determine the impact of caring responsibilities of the caregivers on their mental and physical health highlighting the need for the support systems and targeted interventions. The assessment of this study will contribute to developing better caregiving strategies, increasing caregiver well-being and strengthening dementia caring programs as well. Ultimately, the main goal of this study is to provide invaluable insights for healthcare professionals and organizations working to support caregivers and improve caring strategies for the people with dementia.

Keywords: Dementia, REACH-II Risk Appraisal, Cognitive impairment, Stress, Depression, Well-being.

Dedication

This project is dedicated to my supervisor, Dr. Afrina Afrose, whose constant support, insightful suggestions, and expertise helped me to complete this work. I would like to also dedicate this project paper to my beloved parents, my uncle and my younger sisters for their constant support.

Acknowledgment

I am sincerely grateful to my project supervisor, Dr. Afrina Afrose for her unwavering guidance and support during this entire project work. She has constantly given me advice and encouragement while offering helpful criticism at every stage of the work. I also want to acknowledge the National Institute of Neuro Sciences & Hospital (NINS&H) and the Alzheimer Society of Bangladesh for their unwavering support in data collection. Without their support, it would be difficult for us to collect all the patient's data and conduct interviews. Finally, I would like to express my gratitude to the School of Pharmacy, Brac University.

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List of Acronyms

REACH-II Risk Appraisal	Resources for Enhancing Alzheimer's Caregiver Health
NINS & H	National Institute of Neuro Sciences & Hospital
WHO	World Health Organization

Glossary

Dementia	Dementia is a progressive neurological disorder causing cognitive decline and leading to memory loss, vision loss, and behavioral changes that worsen over time.
REACH-II Risk Appraisal	The REACH-II Risk Appraisal is a structured questionnaire for the caregivers based on an individualized caregiver assessment of distress, depression, health status, behaviors and social support.

Chapter 1

Introduction

1.1 Background

Dementia is a progressive neurological disorder causing cognitive decline, the most common form of Alzheimer's that can cause loss of memory, vision loss, and behavioral changes that worsen over time. The incidence of the disease doubles every five years after the age of 65 (Lui et al., 2024). The REACH-II Risk Appraisal assesses dementia caregivers' depression, distress, health behaviors, and social support, helping them to address the unique challenges they face to improve their well-being and patient care (Basu et al., 2013).

Dementia is not directly hereditary, genetic and other factors also contribute to it. Study says that, post-stroke dementia affects one-third of stroke survivors and 30% of younger patients within three years, worsening with diseases like diabetes and heart diseases (Vijayan et al., 2016). Currently dementia affects 50 million people and the number of affected people is expected to reach about 152 million by 2050, mainly in low and middle-income countries. In 2022, Alzheimer's disease was the seventh leading cause of death in the United States with the number of patients expected to increase, putting a strain on the healthcare system (Alzheimer's disease Facts and Figures, 2022).

Caregivers play a vital role in dementia assisting with daily tasks, providing medication and support. Awareness is very low in countries like Bangladesh where misconceptions persist. A study represents that about 26.2% attributed Alzheimer's to supernatural causes and 68.2% denied their risk (Sharif et al., 2024). Although the disease is not curable, medications such as Donepezil, Rivastigmine, and Galantamine can help manage the symptoms while no-drug approaches maintain well-being with the side effects including loss of appetite, nausea and dizziness (Hafiz et al., 2023).

1.2 Research Gap

Caring for people with dementia is emotionally and physically demanding which often leads to stress, fatigue, and decreased well-being. Although the REACH-II Risk Appraisal is designed to assess caregiver burden and provide targeted support, there is limited research on its effectiveness in diverse caregiving settings, specifically in the low and middle-income countries (Schulz et al., 2003).

The REACH-II Risk Appraisal has been widely used for the caregivers of dementia in order to assess their mental and physical health status. In many low and middle-income countries, like Bangladesh and USA, dementia prevalence is increasing but caregiver resources are limited (Litzelman et al., 2022). Caregivers face unique challenges that may not be fully captured by existing assessment tools. Furthermore, while extensive research has focused on the clinical and biological aspects of dementia, there is limited investigation into how caregiver burden and their stress is measured and managed in this setting.

The main goal of this project is to evaluate the caregivers' of dementia patients' health status through the REACH-II Risk Appraisal to understand its relevance, sensitivity, and potential need for adaptation to local contexts. By identifying specific areas of caregiver distress and factors contributing to their burden, this research will inform appropriate interventions and support processes which will ultimately enhance their ability of care for dementia patients' and improve their well-being.

1.3 Objectives

The main objective of this study is to assess the risk factors and overall impact on the health condition of dementia caregivers by using REACH-II Risk Appraisal while caregiving a dementia patient.

The three focusing area are -

- To estimate dementia caregiver's emotional stress, physical strain, mental and physical health status including anxiety, depression and sleep disturbances by using the REACH-II Risk Appraisal.
- To identify the risk factors affecting dementia caregivers' social and psychological well-being including their stress levels and behaviors that may impact effective caregiving.
- Additionally, to assess caregivers' ability and confidence in managing the challenges associated with providing dementia care.

1.4 Significance

Caregivers of dementia patients' often experience significant emotional, physical, and psychological stresses which can lead to the decline in their overall well-being. The REACH-II Risk Appraisal is designed to provide structural support as well as offering caregivers coping strategies, stress management strategies and skill-enhancing resources.

The significance of this study is, it highlights the effectiveness of REACH-II Risk Appraisal in reducing caregiver stresses, improving mental health, and enhancing caregiving skills as well. Through the assessment, the research provides invaluable insights into how structured interventions can support the caregivers ultimately leading to better patient outcomes. The outcomes of this study have important implications for public health, as they highlight the need for caregiver-focused interventions to prevent stress and improve quality of life. A well-supported caregiver is needed for providing high-quality care which can delay institutionalization of dementia patients and reduce healthcare costs. Additionally, caring for caregivers' mental health can also lead to better family dynamics and overall well-being. This research

can guide and support the healthcare providers and community organizations in implementing effective caregiver supporting programs ensuring sustainable caregiving practices.

Overall, this study contributes to improving dementia care by addressing the needs of both caregivers and patients as well as fostering a healthier caregiving environment.

Chapter 2

Methodology

For the purpose of this research, I have collected information from Alzheimer Society of Bangladesh, National Institute of Neurosciences & Hospital and from some relatives since I believe that doing so would better enable me to comprehend the primary focus in this research.

After gathering all of the necessary data for the study, I set out to assess caregiver burden, stress, and well-being and focus on the way of development for improving the caregiver's healthcare.

The key steps followed during this study are-

Participants meeting specific criteria were selected from the NINS & H and Alzheimer Society of Bangladesh

↓

Participants were contacted and were provided with informed consent before participating

↓

Each participant seated for an in-person interview based on personal preference

↓

Data were collected using the REACH-II Risk Appraisal tool

↓

Scoring was done for the REACH-II Risk Appraisal questionnaire

↓

Analyzing physical and psychological health status and social support in the caregivers of dementia patients

REACH-II Risk Appraisal is a questionnaire tool that contains demographic information for the dementia caregivers and their caregiving load, an assessment served as the main source of data.

These findings are designed to enhance the knowledge of caring for people living with dementia and to improve caregiver's cognitive defenses. To measure the relationship between caregiver stress and cognitive performance, statistical analyses were performed using Microsoft Excel where all the caregivers' consent and ethical considerations were also maintained.

2.1 Study Design

This study used a comparative cross-sectional approach to assess the impact of dementia caregivers on cognitive processes such as caregiver stress, and well-being through the REACH-II Risk Appraisal. The study population of 55 participants were selected for this survey. Prior to participation, each participant provided their informed consent. The study design allow us to assess the relationship between cognitive decline and caregiver stresses while providing care for dementia patients, which helps to develop targeted interventions in order to improve caregiver well-being and patient care.

2.2 Study Population

Participants who met the criteria for this survey were selected from the NINS (National Institute of Neuroscience and Hospital), Dementia section. The eligibility criteria of participation in this study were, individuals must be primary caregivers of dementia patient whether professional or not and who provide daily or frequent care for the patient. Participants with significant complications such as, cognitive impairment, neurological disorders, or severe mental health conditions, stress that might affect their health to complete the assessment were excluded.

After careful ethical consideration, a final sample size of 55 participants was determined. This selection ensured a diverse representation of caregiving experiences and also ensured accurate assessment of caregiver's health condition through REACH-II Risk Appraisal and its relationship to dementia patients' cognitive status.

2.3 Data Sources

For this study, data was collected from the National Institute of Neuro Sciences & Hospital (NINS & H) and from The Alzheimer Society of Bangladesh. Participant's both physical and mental health status and the other relevant information related to the survey was collected. Most of the caregivers had written information about the dementia of their patient. A few caregivers was found detecting dementia based on their previous experience in the journey of caregiving with dementia.

2.4 Data Collection Method

Data was collected using an assessment tool called the REACH-II Risk Appraisal for Dementia caregivers. It is widely used to assess the health status of dementia caregivers. Physical health, such as general well-being, sleep status and executive functioning of the caregiver. Mental health aspects, such as changes in mood and behavior. The tool provides insight into potential emotional or psychological symptoms as well as identifies the level of vulnerability of caregivers, monitors progress and develops strategies for their care for more effective support and interventions. Each participant took part in the in-person interview based on their willingness. Face-to-face interviews were conducted at NINS & H and Alzheimer Society of Bangladesh and each session lasted between 10-15 minutes. This flexible method of data collection made it possible to collect data on a large scale, prioritizing the comfort and preferences of participants.

2.5 Ethical Consideration

Throughout the study, a strict ethical standard was followed to ensure the confidentiality and anonymity of all participants ensuring that personal information is protected and responses are secure. All data was collected and stored securely and no information was shared outside the research team. Each participant was asked about their willingness of participation in the survey and they were also allowed to pause or withdraw at any time if they felt uncomfortable during the assessment. No personal questions were asked during the data collection as it might discomfort them.

2.6 Data Analysis

The REACH-II Risk Appraisal tool was effectively followed in this study to assess caregiver burden. Data were first collected from 55 dementia caregivers and individual scores were recorded in the excel sheet. After ensuring data accuracy and scoring, caregivers were then categorized into low (≤10), medium (11-19) and high-risk (≥20) groups to identify their physical and mental health condition. A graphical representation was created to visualize caregivers' burden based on the scores.

Chapter 3

Result

Table 1 below represents the assessment scores of the dementia caregivers including their risk levels. Each caregiver's score from the REACH-II Risk Appraisal is displayed with their identification, providing individual evaluation and comparison of risk levels.

Table 1 Assessment scores of Dementia caregivers

REACH-II Risk Appraisal		
Caregiver SL. No.	**Score**	**Risk level**
1	8	Low risk
2	13	Low risk
3	11	Low risk
4	17	Moderate risk
5	14	Moderate risk
6	12	Moderate risk
7	11	Low risk
8	11	Low risk
9	14	Moderate risk

REACH-II Risk Appraisal		
10	12	Moderate risk
11	9	Low risk
12	10	Low risk
13	8	Low risk
14	12	Moderate risk
15	13	Moderate risk
16	11	Low risk
17	9	Low risk
18	16	Moderate risk
19	18	Moderate risk
20	16	Moderate risk
21	17	Moderate risk
22	10	Low risk
23	10	Low risk

REACH-II Risk Appraisal		
24	13	Moderate risk
25	11	Low risk
26	9	Low risk
27	14	Moderate risk
28	14	Moderate risk
29	16	Moderate risk
30	15	Moderate risk
31	9	Low risk
32	11	Low risk
33	17	Moderate risk
34	23	Moderate risk
35	20	Moderate risk
36	18	Moderate risk
37	4	Low risk

REACH-II Risk Appraisal		
38	21	Moderate risk
39	18	Moderate risk
40	23	Moderate risk
41	17	Moderate risk
42	20	Moderate risk
43	24	Moderate risk
44	19	Moderate risk
45	14	Moderate risk
46	17	Moderate risk
47	17	Moderate risk
48	13	Moderate risk
49	11	Low risk
50	6	Low risk
51	9	Low risk

REACH-II Risk Appraisal		
52	11	Low risk
53	6	Low risk
54	13	Moderate risk
55	10	Low risk

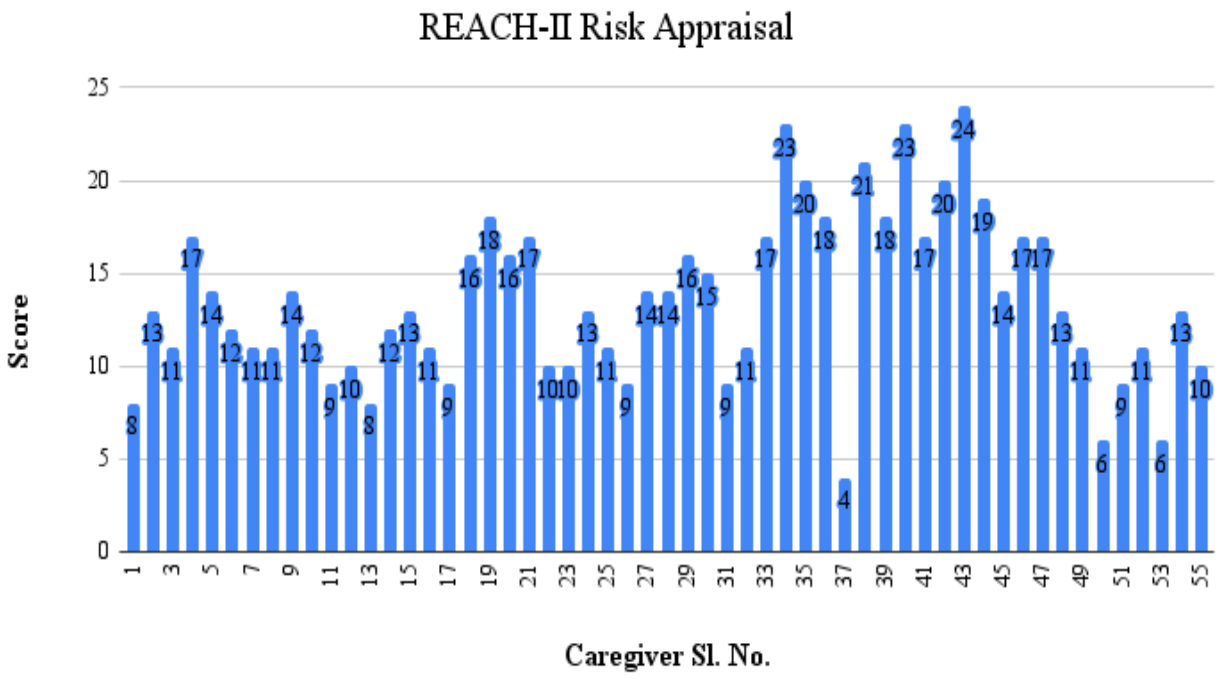

Figure 1 Graphical Representation of REACH-II Risk Appraisal Scores of Dementia Caregivers

The graph shows the REACH-II Risk Appraisal scores of 55 dementia caregivers, who were categorized into different stress and risk levels based on their scores. The scoring criteria categorized caregivers into three groups: low risk (0-9), moderate risk (10-26), and high risk (27 and above). The x-axis indicates the serial number of the caregivers, while the y-axis represents the score ranging from 0 to 25. Each caregiver is given a score, illustrated as a vertical blue bar that reflects their risk level based on the assessment.

The score distribution is highly variable. Some caregivers scored as low as 4, while others reached as high as 24. The graph reveals some caregivers consistently showing higher levels of risk than others. Notably, caregivers in the 33, 37, 39, 41 and 43 serial displays particularly high scores exceeding 20 points that is indicating significant stress. In contrast, some caregivers score much lower, such as caregiver 37 score is only 4 indicating relatively very low risk. Several caregivers scored above 15, displaying high variability whose scores are in the middle part of the chart caregiver numbers 25 to 45. On the other hand, caregivers at the beginning and end of the serial display moderate to low risk, scoring between 6 to 15.

However, among 55 caregivers, 32 of them (58.18%) fall into the moderate risk category and 23 caregivers are at low risk (41.81%) indicating that a significant number of caregivers face considerable challenges.

Table 2 below represents the Risk category of Dementia caregivers based on the scores of REACH-II Risk Appraisal. The caregivers are divided into two categories of low risk and moderate risk level and displayed for the percentage comparison of risk levels.

Table 2 Risk Category of Dementia Caregivers based on the scores of REACH-II Risk Appraisal

Risk Category	Number of dementia caregivers	Rate of percentage
Low Risk	23	41.81%
Moderate Risk	32	58.18%

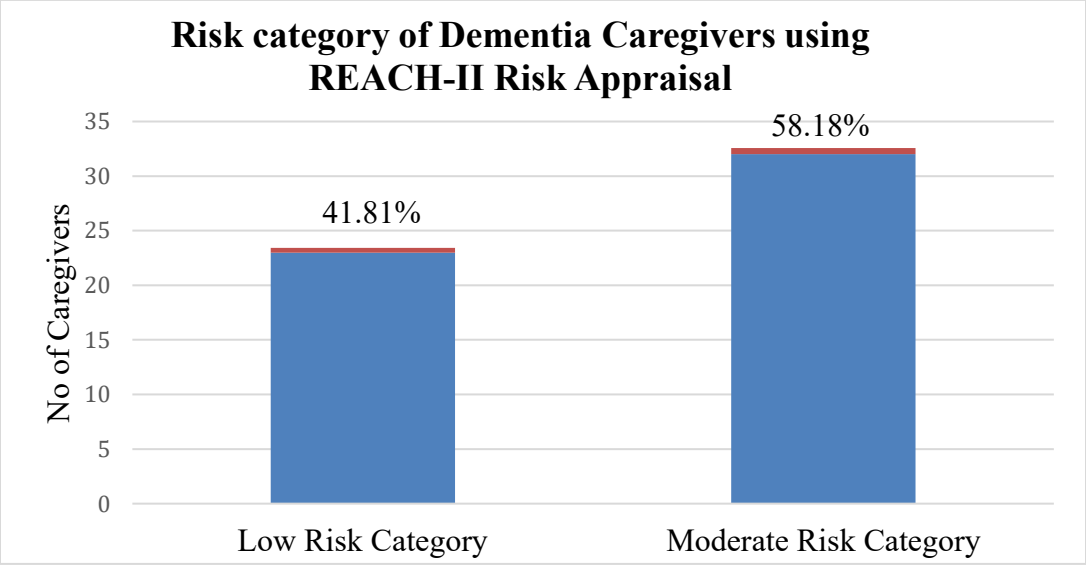

Figure 2 Graphical Representation of Risk category of Dementia caregivers based on the scores of REACH-II Risk Appraisal

Overall, this study result represents a clear visual inspection of the varying levels of stress and burden among dementia caregivers. The significant differences in scores highlight the need for personalized support and interventions as some caregivers face significantly more challenges daily than others.

Chapter 4

Discussion

The REACH-II Risk Appraisal is a tool that assesses the stress and burden of dementia caregivers providing support and insight into their well-being and the challenges they face daily. The graph above illustrates the variability in the risk assessment scores of 55 caregivers ranging from 4 to 24. This study results show that on a percentage of 100 caregivers about 58 of them face both physical and mental health issues while caring for their dementia patients. Compared to the developed countries like the United States and China about 30-40% of caregivers also experience high stress but the caregiver support in Bangladesh is limited compared to theirs. This variability shows the diverse experiences of the caregivers that are influenced by some factors such as severity of the caregiver's condition, availability of support and their personal coping styles (Hu et al., 2023).

The prevalence of dementia varies from country to country that is influenced by demographic factors such as healthcare infrastructure and cultural practices. According to the World Health Organization (WHO), more than 55 million people worldwide suffer from dementia. Due to an aging population it is expected to triple by 2050. This growing prevalence places a considerable burden on the caregivers both emotionally and financially. Currently, approximately 47 million people worldwide are suffering from dementia most of whom are cared for by family members in the community. An analysis found that spousal caregivers of people with dementia experience significantly more stress and severe depressive symptoms and physical problems than the caregivers without dementia. A longitudinal study found that over 24 months, between 37% and 55% of caregivers had episodes of major depression and anxiety disorders without an underlying condition (Joling et al., 2015).

In addition to psychological stresses, dementia also shows a significant economic burden on the families. Many caregivers face an increased financial strain due to medical expenses, caregiving related costs and employment opportunities. In many developed countries like the USA, China and others, financial support programs exist but in Bangladesh the caregivers often fight without economic support. The lack of affordable health care increases the financial burden further in order to take care of the responsibility carefully. Study says that caregivers often experience higher levels of stress than healthcare professionals, due to the failings of need for improved communication and support systems (Hossain et al., 2021). This highlights the need for appropriate support and interventions based on the needs of individual caregivers.

To improve their burden, it is essential to develop culturally sensitive support programs that will meet the unique needs of caregivers in different settings including providing respite care, counseling services and access to educational resources.

Chapter 5

Conclusion

This study represents the effectiveness of dementia caregivers' stress level, well-being as well as their caregiving skill. Investigations indicate that a significant portion of the caregivers experience low to moderate risk of developing dementia, highlighting the needs for the support and interventions. The REACH-II Risk Appraisal questionnaire tool is proven as a valuable tool in identifying caregiver distress and providing insights to their needs. However, with enough support, caregivers can solve the gaps of healthcare systems especially in lower and middle-income countries like Bangladesh. Additionally managing better patient outcomes, reduced healthcare costs leading to strong family mobility.

To conclude, future research should be focused on the development of the study population with some additional factors such as, reducing caregiver burden and developing culturally appropriate interventions to support the caregivers. Overall, this study contributes to the importance of structural evaluation for the caregivers' health condition in order to improve caregiver and patient outcome and raising awareness about dementia caregiving challenges.

5.1 Limitations

This study has several limitations that may impact how broadly applicable the outcomes of the results are. The sample size was about 55, which is relatively small and confined to a localized area and thus the study is found as the limited diversity of caregiving experiences. The REACH-II Risk Appraisal, may not fully capture all the culturally specific factors that can influence caregiver stress in low and middle-income countries. Limited resources can also limit the exploration of additional variables that may influence caregiver well-being.

5.2 Future Recommendations for this study

Future studies should include larger and more diverse samples from multiple regions to increase the flexibility and ability for extrapolation. Adopting a longitudinal study design would allow for tracking all the changes in caregiver stress over time and provide insights into long-term effects. Researchers should consider adapting more tools like the REACH-II Risk Appraisal to better reflect caregiver stress and burden. To improve the outcomes for the caregivers of dementia patients, caregivers need sustainable support interventions including financial, physical and psychosocial support that will ultimately improve their caregiving.

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