

ORIGINAL ARTICLE

THE PROGNOSTIC FACTORS OF DIABETIC RETINOPATHY SEVERITY AMONG TYPE 2 DIABETES MELLITUS IN A TERTIARY TEACHING HOSPITAL

Nur Jannah Ambak¹, Aniza Abd Aziz², Nor Azwany Yaacob¹, Siti Raihan Ishak¹, Wan Mohd Razin Wan Hassan², Syaratul Emma Hashim², Kamal Akhtar²

¹ School of Medical Sciences, Health Campus, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia,

² Faculty of Medicine, Medical Campus, Universiti Sultan Zainal Abidin, 20400, Kuala Terengganu, Malaysia.

ABSTRACT

Diabetic retinopathy (DR) may result in progressive visual impairment and blindness which affects the diabetic patients' morbidity and quality of life significantly. The objective of this study was to determine the proportions and prognostic factors of DR severity among Type 2 diabetes mellitus patients. A cross sectional study was conducted at the Ophthalmology Clinic in a tertiary hospital using the medical record database from 2005 to 2011. A total of 216DR patients were randomly selected. The study outcome was DR severity which was classified into four grading based on the International Clinical Diabetic Retinopathy Scale. Descriptive statistics and Ordinal Logistic Regression were applied using Stata SE/11. The mean (SD) age of DR in this study was 56.06 (9.98) years old with almost equal sex ratio. Proportion of mild non proliferative diabetic retinopathy (NPDR) was 48.6% (95% CI: 40.0, 60.0), moderate NPDR was 28.2% (95%CI: 22.0, 40.0), severe NPDR was 6.9% (95% CI: 4.0, 11.0) and proliferative diabetic retinopathy (PDR) was 16.2% (95%CI: 10.0, 22.0). Diabetic patients that suffered from diabetes mellitus for more than 10 years, having nephropathy, every increased of HbA1c by 1% and higher total cholesterol were at increased risk of worsening DR.

Keywords: *diabetic retinopathy, non-proliferative diabetic retinopathy, proliferative diabetic retinopathy, prognostic factor, type 2 diabetes mellitus*

INTRODUCTION

Flood is the most frequent and devastating natural disaster in Malaysia and enhanced mitigation measures were put in place particularly just before the monsoon season. Yet, their impacts have grown in the last few years and un-precedent occurrence in the last December 2014. The devastated event affected the lives of a large number of individuals, not only physically but also emotionally. The worst hit areas were the states located in east coast namely of Kelantan, Pahang and Terengganu.

Based on previous reports, flood victims apply coping mechanism through economical¹ physical² or psychological^{3,4} approaches. For example they borrowed money, change job and reconstruct their houses^{5,6} as part of physical adaptation. Studies also had proven that victims who faced a higher degree of exposure to a disaster reported greater levels of psychological distress or post-traumatic stress disorder⁶ which contribute to negative health impact and undesirable quality of life. Therefore, people practice certain psychological coping strategies to overcome their stressful events^{3, 7}. Coping strategies was originally defined by Folkman and Lazarus in 1980 as the specific efforts that people employ to master, tolerate, reduce or minimize stressful events.

Coping and adaptation is definitely crucial because it may help to attenuate the psychological impact of flood disasters^{7, 8}. Coping strategies also reflect their actions for longer term survival. Correspondingly, researchers have identified a number of positive influencing factors towards better coping strategies among flood victims such as elderly², awareness of danger of flooding⁹, better family and community support¹⁰. In addition, victims who practiced effective household preparedness were also reported experienced superior coping⁹.

However, little is known about the associated factors of coping strategies, specifically, among flood victims in Malaysia. Similarly, the literature on behavioral and psychological coping strategies among flood victim in this country is limited. Therefore, the objective of this study was to explore the coping approach among the residents in a flood affected traditional village in Kuala Nerus, Terengganu and determine its associated factors.

In relation to this study, the study setting is a flood affected village particularly involving those who settled in the traditional houses which located nearest to the sea. The communities who are

prone to frequent flood and possibly had developed certain strategy to deal with it which is benefit to be explored and shared. Jesse Manuta and Louis Lebel 2005 suggested that individuals who are vulnerable to flood hazards would adapt better if the severity of the recurrent disaster is moderate¹¹.

METHODOLOGY

A cross sectional study which involved 210 adults who lived in traditional houses in a village in Kuala Nerus, Terengganu was conducted in April to May 2015. Universal sampling was applied. Those residents who were terminally ill, mentally or physically disabled were excluded. Exclusion also applied to those who were not present on three separate occasions when the house to house survey was conducted.

This community-based study was part of the curriculum requirement for undergraduate medical students of UniSZA. The operational area was a suburban flood affected village which was the reference population.

The participants' background, experience during the recent flood and their coping responses were assessed using self-administered questionnaire and validated Malay version Brief COPE inventory which consists of 28 items¹². The validity of the Malay version was acceptable except for three items. The overall Cronbach's alpha was 0.8312.

However, this study added two items from the original COPE¹³ into the 'religion' subscale namely 'Item 27: I put my trust in God' and 'Item 20: I seek God's help'. Religion is an important dimension and included in the scale as it serves as an important source of emotional support. It is observed by many studies that one might direct to religion when experiencing stressful events¹⁴.

A forward translation and face validity were executed on the two items. A pilot study was also performed on 75 residents of a nearby village to assess clarity and applicability of the questionnaire. The internal consistency was satisfactory with Cronbach's alpha of 0.625 and 0.862 for the emotional coping scale and overall items respectively.

Thus, the Brief COPE in the present study contains 14 subscales with overall 30 items; two items per subscale (except religion scale with 4 items) and was rated by the four-point Likert scale, ranging from "I haven't been doing this at all" (score of one) to "I have been doing this a lot" (score of four).

The scales assessed different coping dimensions that were problem focused coping strategies (4

subscales: active coping, planning, use of instrumental support,), emotional coping strategies (6 subscales: use of emotional support acceptance, denial, religion, positive reframing, venting,) and less useful coping (4 subscales: humor, substance use, behavioural disengagement, self-blame)¹⁵. A summation of overall score was computed to reflect the total coping score. A reverse scoring was applied to negative items. The higher total coping score represents better respondents' coping strategies.

Data Analysis

The data was analyzed using SPSS version 22 software. Descriptive statistics analyses comprised of estimation of means, standard deviations and/or median, interquartile range were performed. Simple and Multiple Linear Regression were applied to identify the associated factors of total coping score. The statistical significance was set at 0.05.

Ethical approval

This study obtained ethics approval from UniSZA (Universiti Sultan ZainalAbidin) Human Research Committee.

RESULTS

All the respondents were Muslim (100%). The mean (standard deviation) age of respondent was 46.7 (15.54) years with slightly higher percentage of females. Most of them were married (78.1%), education level was up to secondary school (84.3%), unemployed (54.8%) and having low income (85.2%) (Table I).

Table II summarised the items according to domains and subscales. The most common strategy used by the villagers was emotion focused coping, problem focused coping followed by less useful coping.

Table 1: Socio-demographic characteristics of respondent (n=210)

Variable	n	(%)
Gender		
Male	95	45.2
Female	115	54.8
Age ^a		
18 to 40 years old	75	35.7
40 to 60 years old	90	42.9
Above 60 years old	45	21.4
Marital Status		
Single/Divorced	46	21.9
Married	164	78.1
Education Level		
No education /Primary education	78	37.2
Secondary education	99	47.1
Tertiary education	33	15.7
Occupation		
Employed	32	15.2
Self employed	63	30.0
Unemployed	115	54.8
Monthly Income ^b		
Low	179	85.2
Moderate	31	14.8

^a Mean(SD) Age = 46.70(15.54)

^b Mean(SD) Monthly Income = RM1093.28(1196)

In emotion focused coping, being Muslim, majority put high believe by practicing Islamic teaching. Their high religious believe was related with high acceptance, low denial, lack of venting negative feeling and moderate positive reframing. However, they expressed lack of emotional support.

In general, active coping and planning as part of problem focused coping were fair. The situation did not distract them from thinking about the problem related to flood. Nevertheless, they relied on others for help and advice most of the time.

Almost all respondents did not practice less useful or negative coping strategies.

There were four adjusted variables significantly associated with higher total coping score; 1) knowledge on the evacuation site (b=5.38, 95% CI:1.68,9.08, p=0.005), 2) knowledge on health risk of flood (b=3.79, 95% CI:0.92,6.66, p=0.010), and household preparedness namely 3) discussion on flood preparedness with family members (b=2.50, 95% CI:0.84,4.16, p=0.003) and 4) practice of food storage before flood (b=4.506, 95% CI 1.67,7.34, p=0.002).

DISCUSSION

This study provided a series of information on the pattern of coping and characteristics of adult residents who lived in traditional village with recurrent flood. The present study also examine important context such as the awareness, knowledge and household preparedness that shapes the coping strategies of the local flood victims. Individual may use different coping methods in order to cope even with a similar situation. Flood victims will utilize available resources whenever flood occurs. Accordingly, the residents presented with certain characteristic of coping. The preferred coping method was emotion focused coping especially approaches related to religious practice in which they were highly influenced by their Islamic background.

Problem focused coping refers to how much attempt made to solve the problem. Meanwhile, emotion focused coping denote on how emotional approach was applied and less useful coping signify how much behavior and mental disengagement was used. Specifically, denial, self-blame, disengagement and venting were positively related to psychological distress while planning, acceptance, positive reframing and religious coping are associated with growth^{13, 15}.

Table II: Item statistics of coping strategies using Brief COPE Inventory according to domains and subscales (n=210)

Domain	Item	Scale Name and Items	Mean (SD)	n (%)			
				1	2	3	4
				I haven't been doing this at all	I've been doing this a little bit	I've been doing this a medium amount	I've been doing this a lot
	Active Coping						
	G02	I've been concentrating my efforts on doing something about the situation I'm in.	2.433 (3.042)	73 (34.8)	64 (30.5)	47 (22.4)	23 (11.0)
	G07	I've been taking action to try to make the situation better.	2.786 (1.083)	29 (13.8)	63 (30.0)	42 (20.0)	76 (36.2)
	Self-Distraction Items						
	G01	<i>I've been turning to work or other activities to take my mind off things.</i>	1.785 (0.818)	90 (42.9)	81 (38.6)	31 (14.8)	7 (3.3)
	G19	<i>I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.</i>	1.814 (0.835)	86 (41.0)	87 (41.4)	27 (12.9)	10 (4.8)
Problem Focused Coping	Planning						
	G14	I've been trying to come up with a strategy about what to do.	2.205 (0.969)	51 (24.3)	95 (45.2)	34 (16.2)	30 (14.3)
	G25	I've been thinking hard about what steps to take.	2.762 (0.978)	20 (9.5)	71 (33.8)	58 (27.6)	61 (29.0)
	Use of Instrumental Support						
	G10	I've been getting help and advice from other people.	2.076 (0.883)	58 (27.6)	94 (44.8)	42 (20.0)	16 (7.6)
	G23	I've been trying to get advice or help from other people about what to do.	3.414 (0.946)	15 (7.1)	23 (11.0)	32 (15.2)	140 (66.7)
	Use Of Emotional Support						
	G05	I've been getting emotional support from others.	1.838 (0.914)	95 (45.2)	66 (31.4)	37 (17.6)	12 (5.7)
	G15	I've been getting comfort and understanding from someone.	1.919 (0.911)	84 (40.0)	71 (33.8)	43 (20.5)	12 (5.7)
	Acceptance						
	G21	I've been accepting the reality of the fact that it has happened.	3.210 (1.014)	19 (9.0)	33 (15.7)	43 (20.5)	115 (54.8)
	G25	I've been learning to live with it.	2.762 (0.978)	20 (9.5)	71 (33.8)	58 (27.6)	61 (29.0)
	Denial						
	G03	<i>I've been saying to myself "this isn't real."</i>	1.210 (0.565)	178 (84.8)	24 (11.4)	4 (1.9)	4 (1.9)
	G08	<i>I've been refusing to believe that it has happened.</i>	1.305 (0.686)	167 (79.5)	28 (13.3)	9 (4.3)	6 (2.9)
Emotion Focused Coping	Religion						
	G23	I've been trying to find comfort in my religion or spiritual beliefs.	3.414 (0.946)	15 (7.1)	23 (11.0)	32 (15.2)	140 (66.7)
	G29	I've been praying or meditating.	3.576 (0.822)	11 (5.2)	12 (5.7)	32 (15.2)	155 (73.8)
	G27	I put my trust in God.	3.710 (0.689)	7 (3.3)	7 (3.3)	26 (12.4)	170 (81.0)
	G20	I seek God's help.	3.733 (2.918)	11 (5.2)	16 (7.6)	31 (14.8)	151 (71.9)
	Positive Reframing						
	G12	I've been trying to see it in a different light, to make it seem more positive.	2.219 (0.978)	54 (25.7)	84 (40.0)	44 (21.0)	28 (13.3)
	G17	I've been looking for something good in what is happening.	2.691 (1.069)	33 (15.7)	63 (30.0)	50 (23.8)	64 (30.5)
	Venting						
	G09	I've been saying things to let my unpleasant feelings escape.	1.814 (0.863)	89 (42.4)	83 (39.5)	26 (12.4)	12 (5.7)
	G22	I've been expressing my negative feelings.	1.686 (0.889)	112 (53.3)	66 (31.4)	18 (8.6)	14 (6.7)

Table II: Item statistics of coping strategies using Brief COPE Inventory according to domains and subscales (n=210) continue.....

Humour							
G18	I've been making jokes about it.	1.452 (0.795)	145 (69.0)	45 (21.4)	10 (4.8)	10 (4.8)	
G30	I've been making fun of the situation.	1.133 (0.537)	195 (92.9)	7 (3.3)	3 (1.4)	5 (2.4)	
Substance Use							
G4	<i>I've been using alcohol or other drugs to make myself feel better.</i>	1.009 (0.097)	208 (99.0)	2 (1.0)	0 (0)	0 (0)	
G11	<i>I've been using alcohol or other drugs to help me get through it.</i>	1.033 (0.247)	206 (98.1)	1 (0.5)	3 (1.4)	0 (0)	
Less Useful	Behavioural Disengagement						
	G6	<i>I've been giving up trying to deal with it.</i>	1.252 (0.602)	171 (81.4)	29 (13.8)	6 (2.9)	4 (1.9)
	G16	<i>I've been giving up the attempt to cope.</i>	1.262 (0.613)	170 (81.0)	29 (13.8)	7 (3.3)	4 (1.9)
Self-Blame							
G13	<i>I've been criticizing myself.</i>	1.157 (0.436)	182 (86.7)	24 (11.4)	3 (1.4)	1 (0.5)	
G28	<i>I've been blaming myself for things that happened.</i>	1.210 (0.652)	185 (88.1)	14 (6.7)	3 (1.4)	8 (3.8)	
TOTAL SCORE		84.44 (10.843)^a					

Negative statements are italic and not reverse coded.

^a Total coping score in positive direction after reverse coding

The present villagers attempted to find comfort and confidence by putting high trust in Allah and practising Islamic rituals. They commonly utilises religious act such as praying or meditating to address their fear and worries. They also demonstrated related Islamic beliefs which were high acceptance in faith and low denial. Acceptance is viewed as a functional coping reaction where a person who accepts the reality of a stressful situation would be rationale and put his/her best effort to manage the problem. In Islamic point of view, stress and anxiety are viewed as test by Allah and opportunity to improve and become better Muslims¹⁶. A significant research about religious coping has been conducted in many health related studies³. Specifically, spiritual or religious approach upholds coping particularly during post stressful events^{3, 17, 18, and 19}. These strategies provide greater contribution in managing psychological discomfort of the victims and may protect them from depressions and anxieties²⁰. A meta-analysis revealed religious coping methods are consistently associated with improved psychological outcomes across various stressful life events³. Nonetheless, many of them admit lack of emotional support and did not share their flood related problems with others. Hence, the individual victims entail more support given by the family members and community which includes emotional support, advises and empathy in order to improve and motivate their physical and mental state¹⁰.

The problem focused coping assessment revealed that the residents were seems to be engaged with

the problem but they did not plan any preventive strategy. Similarly, other dimensions of adaptation such as active coping and planning on ways to be taken during flood were not satisfactory. Active coping is the method of taking active attempt to get free themselves from stressor and to restructure its impact. Planning is thinking about how to handle a stressor which incorporates action strategies and thinking about what steps to cope with the problem¹⁵. Therefore, emphasis on effective strategies and planning is highly indicated.

The present villagers attempted to find comfort and confidence by putting high trust in Allah and practising Islamic rituals. They commonly utilises religious act such as praying or meditating to address their fear and worries. They also demonstrated related Islamic beliefs which were high acceptance in faith and low denial. Acceptance is viewed as a functional coping reaction where a person who accepts the reality of a stressful situation would be rationale and put his/her best effort to manage the problem. In Islamic point of view, stress and anxiety are viewed as test by Allah and opportunity to improve and become better Muslims¹⁶. A significant research about religious coping has been conducted in many health related studies³. Specifically, spiritual or religious approach upholds coping particularly during post stressful events^{3, 17, 18, and 19}. These strategies provide greater contribution in managing psychological discomfort of the victims and may protect them from depressions and anxieties²⁰. A meta-analysis

revealed religious coping methods are consistently associated with improved psychological outcomes across various stressful life events³. Nonetheless, many of them admit lack of emotional support and did not share their flood related problems with

others. Hence, the individual victims entail more support given by the family members and community which includes emotional support, advises and empathy in order to improve and motivate their physical and mental state¹⁰.

Table III: Associated factors of coping among flood affected residents (n=210)

Variables	Adjusted beta coefficient	95% CI of beta coefficient	P value
Awareness of evacuation site	5.38	1.681, 9.082	0.005
Knowledge on health risk of flood	3.79	0.917, 6.662	0.010
Discuss with family on flood preparedness	2.50	0.836, 4.165	0.003
Ensure food storage before flood	4.51	1.673, 7.339	0.002

^a Multiple linear regression (outcome: Total coping score)
 All independent variables are treated as binary (categorical).
 Model reasonably fits well and assumption met. $R^2 =$

The problem focused coping assessment revealed that the residents were seems to be engaged with the problem but they did not plan any preventive strategy. Similarly, other dimensions of adaptation such as active coping and planning on ways to be taken during flood were not satisfactory. Active coping is the method of taking active attempt to get free themselves from stressor and to restructure its impact. Planning is thinking about how to handle a stressor which incorporates action strategies and thinking about what steps to cope with the problem¹⁵. Therefore, emphasis on effective strategies and planning is highly indicated.

Almost none of the subjects applied behaviour disengagement coping to get through the situation either by making jokes about the situation or using substance abuse to make themselves feel better. These avoidant coping strategies should be the least or best to be at all avoided. Behavioural and mental disengagement apparently related to one's endeavour to giving up and distract them temporarily without accomplish the real goals¹⁵.

Factors associated with coping strategies among flood victims

The residents revealed characteristics of communities that having better coping if they recognize the gazzetted evacuation site. This knowledge is important because it leads to immediate evacuation to the designated evacuation center without delay.

A better coping was also associated with those who demonstrated knowledge on health risk of flood⁹. Subjects' who were knowledgeable on flood hazard demonstrated better emergency measures²¹.

Previous experience of flood results in capability of survivors to anticipate the possible bad outcome.

The existing study supports the evidence that residents who prepared well for the flood^{21,22} either by discussing with their family and ensure food storage before flood has better overall coping. In other words, coping strategies are largely depending on individual and household efforts. Psychologist agreed that individual with assertive personality tend to cope better in any situation. Multiple occurrence of flood makes them adapted to this situation. However, the community or individual needs to alter their regular life and livelihood strategy for a longer term survival.

Recommendation

The findings have implications for public health and clinical interventions. The results proved that interventions for flood affected individuals should integrate the victims' coping strategies^{7, 4}. Enhancement of religious coping strategies may facilitate psychological adjustment to reduce the distress and subsequently foster better quality of life in flood survivors¹⁷. In addition, health care professionals should encourage survivors to use more problem focused coping because it also recognized as an impact-minimising strategy which minimise loss and facilitate recovery.

Limitation

The findings might differ in a more severe and devastating flood because the flood survivors will manifest differently depending on the hazard experienced, their barriers and constraints.

CONCLUSIONS

Whilst our findings representing victims who experienced recurrent moderate severity of flood, the emotion-focused coping was the most preferred coping approach. The significant better coping was associated with the villagers who were aware of the gazetted evacuation site and have knowledge on the flood health hazard. The villagers that plan with their family and practiced storage of adequate food as part of household preparedness also demonstrated significant higher coping level. The mechanism of current coping strategies affect future adaptation options will depend on their willingness to be prepared of any unprecedented event by making aware of safe shelter site, hazard and ability to alert their family on household preparedness.

ACKNOWLEDGEMENTS

The authors would like to thank the local authorities (JKKK) of SeberangTakir, Kuala Terengganu for their cooperation and the villagers who participated in the study. We would also like to extend our appreciation to the medical students of UniSZA, Group 4, Year 3, 2014/2015 who had greatly contributed in the questionnaire revision and data collection.

REFERENCES

1 Braun, B. & Aßheuer, T. Floods in megacity environments: Vulnerability and coping strategies of slum dwellers in Dhaka/Bangladesh. *Nat. Hazards* 2011; 58, 771-787.

2 Berman, R. J., Quinn, C. H. & Paavola, J. Identifying drivers of household coping strategies to multiple climatic hazards in Western Uganda: implications for adapting to future climate change. The Sustainability Research Institute 2014.

3 Ano, G. G. & Vasconcelles, E. B. Religious Coping and Psychological Adjustment to Stress: A Meta-Analysis. *J. Clin. Psychol.* 2005; 61, 461-480.

4 Brende, J. O. Coping with floods: Assessment, Intervention, and Recovery Processes for Survivors and Helpers. *J. Contemp. Psychother* 1998; 28, 107-139.

5 Sakijege, T., Lupala, J. & Sheuya, S. Flooding, flood risks and coping strategies in urban informal residential areas: The case of KekoMachungwa, Dar es Salaam, Tanzania. *J. Disaster Risk Stud.* 2012; 4, 1-10.

6 Srikuta, P., Inmuong, U. & Inmuong, Y. Health Impacts of Rural Flood and Community Coping Strategies in Northeast Thailand. *Int. J. Curr. Reserach Acad. Rev.* 1, 103-110 (2014).

7 Aslam, N. & Kamal, A. Coping Strategies as a Predictors of Psychological Distress and Post Traumatic Growth among Flood Affected Individuals. *J. Alcohol. Drug Depend.* 3, 1-5 (2015)

8 Abaya, S. W., Mandere, N. & Ewald, G. Floods and health in Gambella region, Ethiopia: A qualitative assessment of the strengths and weaknesses of coping mechanisms. *Glob. Health Action* 2009; 2, 1-11.

9 Nyakundi, H., Mogere, S., Mwanzo, I. & Yitambe, A. Community perceptions and response to flood risks in Nyando District, Western Kenya. *J. Disaster Risk Stud.* 2010; 3, 346-366.

10 Yawson, D. O. et al. A needs-based approach for exploring vulnerability and response to disaster risk in rural communities in low income countries. *Australas. J. Disaster Trauma Stud.* 2015; 19, 27-36.

11 Manuta, J. & Lebel, L. Climate change and the risks of flood disasters in Asia : crafting adaptive and just institution. *Human Security and Climate Change: An International Workshop.* 2005.

12 Yusoff, M. The Validity of the Malay Brief COPE in Identifying Coping Strategies among Adolescents in Secondary School. *Int. Med. J.* 2011; 18, 29-33.

13 Carver, C. S., Scheier, M. F. & Weintraub, J. K. Assessing coping strategies: a theoretically based approach. *J. Pers. Soc. Psychol.* 1989; 56, 267-283.

14 Pargament, K. I. & Abu Raiya, H. A decade of research on the psychology of religion and coping: Things we assumed and lessons we learned. *Psyke and Logos* 2007; 28, 742-766.

15 Carver, C. S. You Want to Measure Coping but Your Protocol's Too Long: Consider The Brief Cope. *Int. J. Behav. Med.* 1997; 4, 92-100.

16 MohdRadzi, H., Sipon, S., Othman, K.,

- NikNazli, N. N. N. & AbdGhani, Z. Demographic Influence on Muslim Flood Victim Wellbeing in Flood Prone Districts in Malaysia. *Int. J. Soc. Sci. Humanit.* 2015; 5, 561-566.
- 17 Abdullah, S., Sipon, S., MohdRadzi, H. & AbdGhani, Z. Stress and Religious Coping Among Flood Victims in Malaysia. in 2015 WEI Int. Acad. Conf. Proceedings, Vienna Austria 79-87 .
- 18 Chan, C. S. & Rhodes, J. E. Religious Coping, Posttraumatic Stress, Psychological Distress, and Posttraumatic Growth Among Female Survivors Four Years After Hurricane Katrina. *J. Trauma. Stress* 2010; 23, 215-222.
- 19 Chan, C. S., Rhodes, J. E. & Perez, J. E. A Prospective Study of Religiousness and Psychological Distress Among Female Survivors of Hurricanes Katrina and Rita. *Am J Community Psychol* 2013; 18, 1199-1216.
- 20 Oman, D. & Reed, D. Religion and mortality among the community-dwelling elderly. *Am. J. Public Health* 1998; 88, 1469-1475.
- 21 Thielen, A. H., Kreibich, H., Müller, M. & Merz, B. Coping with floods: preparedness, response and recovery of flood-affected residents in Germany in 2002. *Hydrol. Sci. J.* 2007; 52, 1016-1037.
- 22 Motoyoshi, T. Public Perception of Flood Risk and Community-based Disaster Preparedness. (2006). Available from: <https://www.terrapub.co.jp/e-library/nied/pdf/121.pdf> (Accessed 7th October 2015).