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Consistency of prediction across generation: explaining quality of life by family functioning and health-promoting behaviors

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Abstract

Purpose The study aimed to investigate the consistency of relationship between family functioning, health-promoting behaviors, and quality of life across generations in joint families.

Method The sample comprises of 79 joint families ($N = 316$ members, $n = 79$ grandparents (grandfathers = 27, grandmothers = 52) $n = 158$ parents (fathers = 79, mothers = 79), and $n = 79$ grandchildren (girls = 61, boys = 18)). Data were collected on Self-Report Family Inventory, SFI, Health-Promoting Lifestyle Profile II, HPLP-II, and World Health Organization Quality of Life Scale BREF WHO QOL BREF. All three variables, i.e., family functioning, health-promoting behaviors, and quality of life, were modeled as latent variables. Analyses were conducted separately for each group.

Results Results showed that in grandparents, family functioning predicted ($\beta = .44$, $p < .01$,) health-promoting behaviors ($R^2 = .20$), which in turn predicted ($\beta = .26$, $p < .05$) quality of life ($R^2 = .85$). Family functioning appears to have significant indirect effects ($\beta = .34$, $p < .01$) through health-promoting behaviors on quality of life. The model fit indices showed a good fit (IFI = .917, CFI = .910, RMSEA = .078) of the model of the data. For all other groups, i.e., fathers, mothers, and grandchildren, family functioning and health-promoting behaviors independently predicted quality of life ($R^2 = .55$, .67, and .54, respectively).

Conclusion Our results showed that family functioning and health-promoting behaviors are consistent predictors of quality of life across generations.

Keywords Family functioning · Health-promoting behavior · Quality of life · Joint family · Cross-generational comparison

Introduction

Family is a grouping of people who are living together and are related by blood, marriage, or adoption [1]. Despite of the fact that every family is unique, all families share some common responsibilities, i.e., functions and importance of families lies in these functions [2]. Gratifying physical needs, providing love and affection, transferring attitudes and values, and socializing children are some of the common functions of all families [3]. Most obvious function of all families is to gratify physical needs (food, shelter, and sex) [4] of its members [2]. Another important need of human being is to feel accepted and loved, and developing ability of giving and receiving love within one's family is very helpful for the development of positive self-concept [2]. Families are of many forms, i.e., nuclear families, extended families or joint families, single parent families, and blended families. Extended families or joint families include parents, children, grandparents, and other relatives, i.e., uncle, aunts, and cousins [5]. Family function has a close relationship with the structure of family. With the increase in size, the complexity in family increases, so there are more functions to perform in big families [6].

Literature suggests that healthy families endorse the functioning and well-being of their members through the preservation of clear communication, unambiguous and

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affective communication, equally beneficial patterns of interaction, development of clear boundaries between subsystems of families and generations, residing in families, and handling change in expectations over time, based on the internal demands of members and external demands of environment [7]. A sense of balance is maintained among the needs for stability and change in family that endorse the health of individual member. Transitions across the life cycle result in problems in families. Dysfunctional families are unable to go through these transitions without experiencing problems [8]. Recent research suggests that family affects health-related quality of life of individuals regardless of their gender, age, quality of social support they are receiving, and lifestyle risk factors [9]. Studies reported that family functioning has a strong positive relationship with quality of life [10, 11]. Another study reported that disorder in family functioning is negatively associated with quality of life [12]. In line with the literature, we assumed that family functioning may have a strong incremental effect in quality of life of family members. Additionally, the current study also aimed at testing stability of effect of family functioning by investigating its role in quality of life of all three generations living together in a combined family system.

General positive health behaviors comprise of fruit and vegetable intake, regular physical exercise, sensible driving, using a seatbelt, and taking benefit of medical and dental screening chances [13]. Health is optimal well-being that adds and contributes to a person's quality of life [5]. Studies reported that quality of life can be predicted by health-promoting behaviors [14, 15]. This led us to include health-promoting behavior in our investigation of predictors of quality of life across generations.

According to World Health Organization (WHO), a wide range of personal, social, environmental, and economic factors are involved in determining health status of individuals [16]. Consequently, family functioning is considered as a determinant of health in individual's social environment. The family system model also addressed health and illness in context of families [17]. The model addresses three dimensions such as: (a) psychosocial types of illness and disability, (b) major developmental phases in their natural history, and (c) family system variables in relationship with health and illness [17]. The model suggests that functioning of a family interacts with health and illness of its members [18]. Research also indicated that information transfer is prevalent in extended families [9]. Information transfer helps in maintaining continuation of lifestyle within family [9]. Studies addressing information transfer suggest that extended families communication patterns are associated with selection of eating patterns [19]. Healthful and unhealthful eating practices are associated with communication in extended families.

Grandparents and parents struggle to keep children on healthier diets, and if their struggles end in failure, they express anguish and distress [20]. These evidences suggest that families, beyond parent child relationships, participate in learning and communicating about various ways to improve their health behaviors. Based on these findings, we assumed that family functioning might affect quality of life directly as well as indirectly through health-promoting behaviors across three generation, i.e., grandparents, parents, and grandchildren. Contribution of the present study lies in its unique sample including three generations living together, and interacting and influencing each other. Additionally, the study explores the relationship between family functioning, health-promoting behaviors, and quality of life and confirms it across generations, providing a comprehensive picture for consistency of relationship which is lacking in empirical literature.

Methods

Sample and procedure

Sample of present study included joint families only. A family was taken as sample only if three generations (grandparents, parents, and children) were living together in same house. Furthermore, none of the family members was suffering from any serious medical or psychological condition, and they were able to respond (especially grandparents), whereas at least, one grandchild was 10 years or older. Sample taken from a family included: one grandparent, both parents, and one grandchild. A total of 160 joint families meeting the inclusion criteria were approached at their homes. Sample was drawn through purposive sampling method. Sample was taken from Sheikhupura city. Out of 160 families, 150 agreed to participate. Questionnaire booklets were distributed among participants, and they were instructed to respond to all questions. For the illiterate participants, appointments were made at their home, and the first author herself read questionnaire to collect their responses. Participants were compensated with wristbands containing quotes about healthy life style for their cooperation. Only 90 families (60 %) returned the questionnaires, out of which 79 (88 % approximately) were included in the analysis. The excluded 11 forms have a missing set of a family member (seven missing forms of grandparents, two missing forms of parents, and two missing forms of grandchildren). The final sample included 79 joint families, $N = 316$ members, $n = 79$ grandparents (grandfathers = 27, grandmothers = 52) age ranged (53–90) with mean $\pm$ SD (73.95 $\pm$ 10.34 years); $n = 158$ parents (fathers = 79, mothers = 79), age ranged (30–65) with mean $\pm$ SD (43.92 $\pm$ 6.25 years); and $n = 79$ grandchildren (boys = 18, girls = 61) age ranged (15–27) with mean $\pm$ SD (17.15 $\pm$ 2.38 years).

Statistical analyses

Analyses were conducted using IBM SPSS version 21 and IBM AMOS version 21. Reliability of the instruments including Self-Report Family Inventory, Health-Promoting Lifestyle Profile II, and World Health Organization Quality of Life Scale BREF was estimated by computing separate Cronbach's alpha for all three generation, i.e., grandparents, parents, and grand children. One-way ANOVA was employed to test differences on study variables across three generations. Pearson bivariate correlations were used to examine the pattern of relationship between study variables at $p < .05$. Consistency in predication was tested using structural equation modeling. Model fit indices were estimated including Chi-Square, Cumulative Fit Index (CFI), Incremental Fit Index (IFI), and Root Mean Square Error of Approximation (RMSEA) for each model.

Instruments

Self-Report Family Inventory (SFI)

Self-Report Family Inventory measures perceptions of an individual about his/her family competence and style. It is a 36 items instrument, with response categories ranged from one (fits our family very well) to five (does not fit our family), and score range for instrument is 36–180. Higher scores represent greater competence. Alpha coefficient for SFI ranges from .84 to .88 [21].The SFI measures five different factors: (a) health/competence, (b) conflict, (c) cohesion (d) directive leadership, and (e) expressiveness [22]. The scale was translated (in Urdu) using the Standard Back Translation method. Scale was translated for the very first time to use in the present study. Psychometric properties were established on the study sample. Item 24 was deleted due to negative corrected item total correlation. Alpha reliability coefficient was high for the study sample for all populations, i.e., for grandparents (.90), parents (.89), and grandchildren (.85).

Health-Promoting Lifestyle Profile II

Health-Promoting Lifestyle Profile II measures behaviors related to health-promoting lifestyles. Items of HPLP-II are scored as never (N) = 1, sometimes (S) = 2, often (O) = 3, and routinely (R) = 4. Six subscales of HPLP-II include health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management. Total score is obtained by calculating mean for scale and subscales as well, to allow meaningful comparison between subscales. Alpha coefficient for scale is .94, and for subscales, it ranges from .79 to .87 [23]. The scale was translated (in Urdu) for the first time. It was translated by using the Standard Back Translation method to use in the present study. Psychometric properties were established on the study sample. Alpha reliability coefficient for HPLP-II appeared to be high for the study sample for all populations (grandparents = .89, parents = .90, and grandchildren = .91).

World Health Organization Quality of Life Scale BREF

WHO QOL is a 26 items, 5-point rating scale. Scoring category ranges from strongly disagree (1) to strongly agree (5). The score range was 26–130. High scores indicate higher quality of life. WHO QOL measures quality of life in four dimensions including physical health, psychological health, social relationships, and environment. Cronbach's alpha reliability coefficient for physical health and psychological health is above .75; for social relationships, it ranges from .51 to .77; and for environment, it ranges from .65 to .87 [24]. A translated version of the scale [25, 26] was used for the present study. Item six was deleted due to negative corrected item total correlation. Alpha reliability coefficient of WHO QOL BREF was high for the study sample (i.e., grandparents = .84, parents = .87, and grandchildren = .84).

Results

Preliminary analysis revealed that all variables of the study are normally distributed, i.e., skewness $<\pm2$ (Table 1). Cronbach's alpha reliability ranged from .85 to .91 (Table 1), which suggests that all study variables have high reliability across three generations. Mean differences on study variables across generations suggest that grandparents, parents, and grandchildren differ significantly on expected demographic, i.e., age and education. Given the chronological difference, it is no surprise that grandparents are oldest and have gone through least years of formal education. No significant mean differences appeared on family functioning, health-promoting behaviors, and quality of life (i.e., $p > .05$).

Bivariate correlations demonstrated in Table 2 suggest that grandparents' self-reported family functioning significantly positively correlated with health-promoting behaviors ($r = .24$, $p < .05$) and quality of life ($r = .50$, $p < .01$). Additionally, grandparents' self-reported health-promoting behaviors also significantly positively correlated with self-reported quality of life ($r = .63$, $p < .01$). Among parents, fathers and mothers, self-reported family functioning significantly positively correlated with self-reported quality of life (i.e., $r = 47$, and $r = .49$, respectively, $p < .01$). Similarly, parents' self-reported health-promoting behaviors significantly positively correlated with self-reported quality of life ($r = .56$, $p < .01$) for mothers and

Table 1 Psychometric, descriptive, and mean differences in study variables across generations

	No. of Items	Grandparents (n = 79)			Parents (n = 158)			Grandchildren (n = 79)			F	p
		Skew (SE)	a	M (SD)	Skew (SE)	a	M (SD)	Skew (SE)	a	M (SD)		
Age		.11 (.28)	–	73.95 (10.34)	.19 (.20)	–	43.92 (6.26)	.62 (.27)	–	17.15 (2.84)	1310.31	.00
Education in years		.48 (.34)	–	2.46 (1.50)	–.71 (.20)	–	4.37 (1.42)	–.45 (.27)	–	4.69 (1.56)	47.75	.00
Family functioning	35	–1.14 (2.72)	.90	141.08 (17.68)	–1.45 (.20)	.89	141.95 (17.25)	–.88 (.27)	.85	140.91 (15.32)	.13	.88
Health-Promoting Behaviors	52	.097 (.28)	.89	2.60 (.41)	.44 (.19)	.90	2.63 (.40)	–.16 (.27)	.91	2.57 (.38)	.51	.60
Quality of life	25	–.549 (.28)	.85	97 (12.58)	–.05 (.19)	.87	97.95 (12.48)	–.04 (.27)	.85	97.01 (11.70)	.23	.79

($r = .51, p < .01$) for father. Contrary to that, self-reported health-promoting behaviors appear to correlate significantly only with mothers' self-reported quality of life ($r = .23, p < .05$). In grandchildren's, self-reported quality of life appears to have significant positive relationships with family functioning ($r = .49, p < .01$) and health-promoting behaviors ($r = .40, p < .01$).

Interesting patterns appeared across generation, i.e., grandparents reported that family functioning is significantly positively correlated with parents' health-promoting behaviors (both fathers' and mothers' $r = .25$, and $r = .27$, respectively, $p < .05$), and among parents, fathers' self-reported family functioning is significantly positively correlated with grandchildren's health-promoting behaviors ($r = .26, p < .01$). Even more enticing pattern appeared between family functioning and quality of life across generations. As presented in Table 2, grandparents' self-reported family functioning is positively correlated with parents' (both fathers' $r = .50$, and mothers' $r = .48; p < .01$) and grandchildren's ($r = .23, p < .05$) self-reported quality of life. Furthermore, parents' self-reported family functioning (both fathers' $r = .31$, and mothers' $r = .39; p < .01$) is also positively correlated with grandchildren' self-reported quality of life. Similarly, grandparents' self-reported health-promoting behaviors is positively correlated with parents' (both fathers' $r = .39$, and mothers' $r = .46; p < .01$) self-reported quality of life. Furthermore, parents' self-reported health-promoting behaviors (both fathers' $r = .23$, and mothers' $r = .26; p < .05$) is also positively correlated with grandchildren' self-reported quality of life. Significant positive correlations appeared across generations within family functioning (r range .29–.69; $p < .05$), within health-promoting behaviors (r range .23–.65; $p < .05$), and within quality of life (r range .31–.76; $p < .01$).

Model testing was conducted to assess the relationship between effect of family functioning on health-promoting behaviors and quality of life separately for all the three generations. Latent variable model was generated, and family function was estimated as a latent construct using all five dimensions, i.e., health/competence, conflict, cohesion, expressiveness, and directive leadership (factor loading lambda (λ) ranged .41–1.0 for grandparents, .50–.99 and .49–1.0 for parents: fathers and mothers, respectively, and .12–.99 for grandchildren). Latent construct health-promoting behaviors consisted of all six dimensions, i.e., health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management (λ ranged .45–.85 for grandparents, .48–.81 and .36–.79 for parents (both fathers and mothers, respectively), and .30–.96 for grandchildren). And latent construct quality of life constituted all five dimensions, i.e., physical, psychological, social, environmental, and general health (λ ranged

Table 2 Correlation matrix of family functioning, health-promoting behaviors, and quality of life across generations ($N = 316$)

	1	2	3	4	5	6	7	8	9	10	11
1. FF grandparents											
2. FF fathers	.62**										
3. FF mothers	.56**	.69**									
4. FF grandchildren	.33**	.29*	.52**								
5. HPB grandparent	.24*	.16	.24*	.25*							
6. HPB fathers	.25*	.14	.12	.08	.55**						
7. HPB mothers	.27*	.20	.23*	.21	.49**	.65**					
8. HPB grandchildren	.17	.26*	.18	.16	.23*	.42**	.53**				
9. QOL grandparents	.50**	.28*	.39**	.26*	.63**	.32**	.36**	.15			
10. QOL fathers	.50**	.47**	.36**	.36**	.39**	.51**	.44**	.34**	.57**		
11. QOL mothers	.48**	.45**	.49**	.41**	.46**	.53**	.56**	.31**	.56**	.76**	
12. QOL grandchildren	.23*	.31**	.39**	.49**	.10	.23*	.26*	.40**	.33**	.59**	.49**

FF family functioning, *HPB* health-promoting behaviors, *QOL* quality of life

* $p < .05$, ** $p < .01$

.55–.64 for grandparents, .41–.81, and .49–.76 for parents (fathers and mothers, respectively), and .45–.74 for grandchildren).

Model 1 (a) as presented in Fig. 1a was used to test effect of family functioning and health-promoting behaviors in explaining quality of life of grandparents. Results showed that quality of life of grandparents is predicted by family functioning directly ($\beta = .26$, $p < .01$) and indirectly ($\beta = .34$, $p < .01$) through health-promoting behaviors. Family functioning predicted health-promoting behaviors ($\beta = .44$, $p < .01$; $R^2 = .20$) which in turn predicted quality of life ($\beta = .78$, $p < .01$) explaining a total of 85 % variance in quality of life of grandparents. Model 1 (b) and Model 1 (c) elaborated quality of life of parents (fathers and mothers, respectively). As presented in models, quality of life of both (fathers and mothers) was predicted directly by both family functioning ($\beta = .38$, and, $\beta = .46$, respectively $p < .01$) and health-promoting behaviors ($\beta = .64$, and, $\beta = .67$, respectively $p < .01$) explaining a total of 55 % variance in fathers' quality of life and 67 % variance in mothers' quality of life. Finally, Model 1 (d) as presented in Fig. 1d was used to explain the quality of life of grandchildren. The results showed a similar pattern, i.e., quality of life of grandchildren was directly predicted by both family functioning ($\beta = .46$, $p < .01$) and health-promoting behaviors ($\beta = .67$, $p = .01$) explaining a total of 67 % variance in quality of life of grandchildren. Model fit indices as presented in Table 3 showed that all four models fitted the data very well, i.e., CFI ranged (.90–.92), IFI ranged (.91–.93), and RMSEA ranged (.07–.08).

Discussion

The study was designed to investigate the predictive role of family functioning and health-promoting behaviors in explaining quality of life across generations. Aim was to assess consistency in predictability of quality of life by family functioning and health-promoting behaviors across generations. Our results of preliminary analysis showed that there were no issues in data as normal distribution, and good reliability indices were observed for all study variables across all the three generations. Given that exclusion and inclusion criteria were conservatively followed, we did not expect any serious deviation on study variables across generation. It is consistent with the prior literature, suggesting that information transfer is prevalent in extended families. It also suggests that lifestyle and many of routine activities of family members are related closely [9]. Results showing only significant differences on age and education are no wonder as per inclusion criteria. A clear age difference is expected among grandparents, parents, and grandchildren, and likewise trend of being educated was expected to be least among grandparents and most among grand children. Regarding years of formal education being attended by grandparents, parents, and grand children, the difference observed was again as per expectations with grandparents having attended least years of formal schooling given the low literacy rate during their childhood. Parents also appear to have less years of formal education but that might be mainly due to the fact that the majority of mothers were illiterate, whereas with developing trends, children's education is a priority of majority of the families.

In line with earlier research, our study presented significant positive relationship between quality of life and its predictors, i.e., family functioning and health-promoting behaviors for all the three generations. The findings are aligned with previous researches suggesting that family functioning has a strong positive relationship with quality of life [12, 19] and studies reporting strong relationship between health-promoting behaviors and quality of life [14, 27]. Furthermore, the positive relationship between family
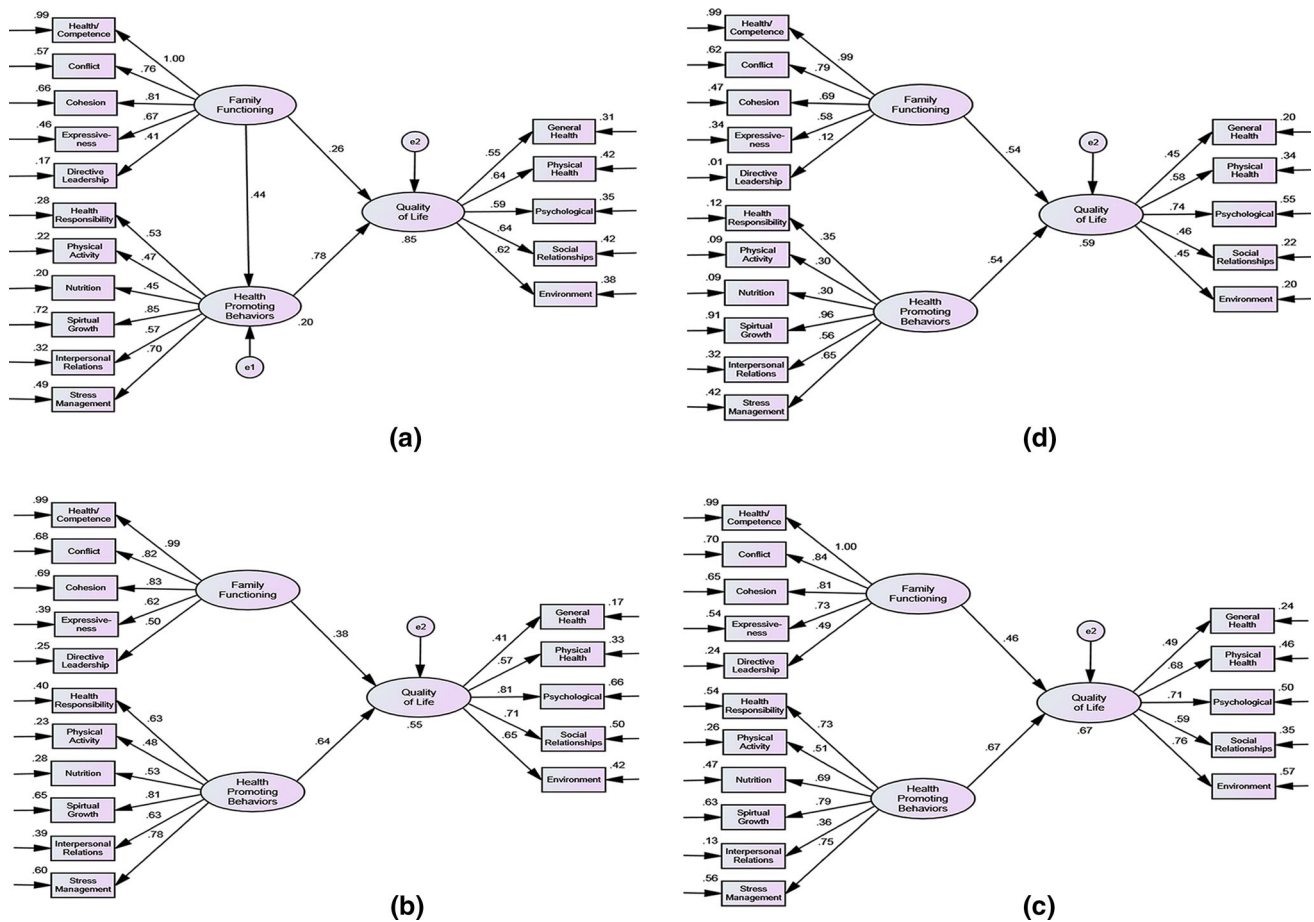
Fig. 1 Latent variables model predicting quality of life by family functioning and health-promoting behaviors (a Grandparents, b Fathers, c Mothers, d Grandchildren)

Table 3 Model fit indices of the relationship between family functioning, health-promoting behaviors, and quality of life across generations

	Group	x^2 (df)	CFI	IFI	RMSEA
Model 1(a)	Grandparents	142.61 (96)	.910	.917	.078
Model 1(b)	Parents (fathers)	139.83 (96)	.923	.928	.076
Model 1(c)	Parents (mothers)	141.83 (94)	.924	.929	.080
Model 1(d)	Grandchildren	139.98 (98)	.901	.909	.073

functioning and health-promoting behaviors is consistent with family systems model, explaining that structural patterns of families, patterns of communication, multigenerational patterns, and belief systems of families are interrelated with health and illness [6]. Rolland also reported that functional families, on all theses aspects of family components, are healthier [28]. Though, in contradistinction with literature, this relationship did not appear to exist in our study for fathers and grandchildren. An explanation might be the cultural variation, i.e., in collectivist cultures, grandparents and mothers are more likely to spend their maximum time at home, and hence, their health-promoting behaviors are more subject to functioning

as compared to fathers' and grandchildren's, who spend relatively less time at home due to their job and education-related activities, respectively.

Our results also supported the literature, reporting that positive family relationships endorse adaptive functioning in its members through increasing the chances of positive health outcome, i.e., better self-esteem and quality of life [29–31] and also through minimizing the risk of negative health outcomes, i.e., poor health [31] and psychopathology [30, 31].The most interesting patterns of relationship as indicated in our study are relationship between quality of life and its predictors across generations. Though studies have shown these relationships

within same groups, the evidences are scars for existence of prediction across generations. Our results showed that grandparents' reported that family functioning and their health-promoting behaviors affect later generations' both health-promoting behaviors and quality of life. Similar relationships appear to be replicated between parents and grandchildren suggesting the critical role of family functioning and health-promoting behaviors of elder generations for the health-promoting behaviors and quality of life of their offspring.

Finally, to investigate consistency in prediction precisely, model testing was conducted with latent variables across all three generations. Our results showed a consistency in explaining quality of life across generations by suggesting both family functioning and health-promoting behaviors as valid and reliable predictors. Results explained a large amount of variation in quality of life of all three generations (four groups), i.e., grandparents, parents (fathers and mothers), and grandchildren. Results also showed that family functioning effects quality of life both directly and indirectly though no indirect effect appeared for all other groups. These finding are aligned with previous researches suggesting that family functioning [10, 12] and health-promoting behaviors [14, 27, 32] have a strong relationship with quality of life.

Conclusion

The study was aimed to explore the relationship between family functioning, health-promoting behaviors, and quality of life in joint families. Our findings suggested that family functioning and health-promoting behaviors are reliable and consistent predictors of quality of life across generations. Furthermore, in joint families, family functioning as perceived by elder generation and their health-promoting behaviors predicts quality of life of younger generations.

Limitations and suggestions

The study sample consisted of joint families with inclusion criteria as "A family was taken as sample only, if three generations (grandparents, parents, and children) were living together in same house"; hence, generalization of results requires some precautions. Findings from this multi-generational study only apply to similar living situations. Additionally, potential covariates (e.g., current major (chronic) illness, socioeconomic status of the household.) had not been accounted for their influence on the study findings. Further studies are needed to be done to overcome this limitation. Though multi-informant and cross-generational data are the strength of the study, a longitudinal design might better estimate cross-generational effects.

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