

# Impact of Individual and Organizational Variables on Quality of Life

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Accepted: 22 December 2014 / Published online: 27 December 2014  
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**Abstract** The general goal of this study consists of analyzing the influence of different types of human services in the quality of life of their nested users. Several multilevel models were proposed to test for significant differences not only in the overall quality of life score, but also in each of the eight core domains. Participants included 11,624 users of social and human services and the assessment quality of life instrument was the GENCAT Scale. Variables that were studied in the different models were gender, age, and diagnostic group (elderly, intellectual disability, physical disability, mental health problems, and chemical dependency) at the individual user level (level 1: individual), while type of services—in terms of the main population addressed by their supports (i.e. the aforementioned groups)—was studied at service level (level 2: organizational). In order to explain differences, individual characteristics were introduced first, types of services were introduced next, and finally joint individual and service variables were introduced in a single model. The main results of this study were that personal and organizational variables exhibited a different level of influence on users' quality of life; and also that the type of services significantly influenced the quality of life of its users. The results of this study lead to practical implications for services providing support to these diagnostic groups, especially for those interested in managing, assessing, and improving quality of life related personal outcomes at the user level as well as quality enhancement at the organizational level.

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**Keywords** Intellectual disability · Elderly · Physical disability · Substance abuse · Mental health · Multilevel

## 1 Introduction

Quality of life is a concept broadly used in research and service delivery in the field of intellectual and developmental disabilities; it is being expanded and generalized to other diagnostic groups who are at risk for social exclusion and other human service recipients such as those with mental health problems, chemical dependency, physical and sensory disabilities, and the elderly (Gómez et al. 2011). The extensive research on quality of life over the last three decades in the field of intellectual disabilities has provided useful models to explore the impact of individual and environmental factors on quality of life related personal outcomes (Chiu et al. 2013; Cummins 2005; Felce and Perry 1995; Gómez et al. 2014b; Petry et al. 2005; Schalock and Verdugo 2002; Zuna et al. 2010).

In this work, we understand quality of life according to the model proposed by Schalock and Verdugo (2002) as a multidimensional phenomenon comprising eight core domains that constitute personal wellbeing (Schalock et al. 2011). The eight domains (i.e. emotional wellbeing, physical wellbeing, material wellbeing, personal development, social inclusion, interpersonal relationships, self-determination, and rights) are assessed through domain-referenced indicators (Claes et al. 2010; Gómez et al. 2012). These indicators are behaviors and conditions that are culturally-based and enable the measurement of quality of life related personal outcomes (each indicator becomes one or various scale items). Evidence about the validity of the model can be found in a wide number of studies (Gómez et al. 2014a; Gómez et al. 2011; Jenaro et al. 2005; Schalock et al. 2005; Verdugo et al. 2014; Wang et al. 2010).

As previously mentioned, quality of life domains are influenced by personal characteristics and environmental factors. Actually, the concept of quality of life perfectly integrates the contextual model of human functioning and the ecological model of disability that focuses on the interaction between person and environment: individuals interact with the contexts to which they belong, they are influenced by those social groups or contexts to which they belong, and also those groups are in turn influenced by the individuals who make up the group. In this way, individuals and their groups are conceptualized as a hierarchical system of individuals nested within groups, with individuals and groups defined at separate levels of this hierarchical system (Hox 2010). Several authors point out personal characteristics such as gender, race, intellectual functioning, adaptive behavior, social economic status, as well as highlighting the role of other variables related to organizational cultures and support provider systems (e.g. level of personal involvement of the clients, level of personal growth opportunities, kind of service, individualized supports) (Claes et al. 2012; Gómez 2014; Schalock et al. 2007; Schalock and Verdugo 2012, 2013).

Claes et al. (2012) carried out a study to determine the relative impact on assessed quality of life related personal outcomes of support strategies and environmental factors, in addition to client characteristics in 186 persons with intellectual disabilities in The Netherlands. Results indicated that the availability of support strategies, living arrangements, status of employment, and level of intellectual disability significantly impacted quality of life outcomes. Other researchers have shown that enhanced outcomes are related

to the level of self-determination (Wehmeyer and Garner 2003), social networks (Emerson and McVilly 2004), and community integration (Miller and Chan 2008).

More recently, a study about provider profiles in Catalonia analyzed aggregated data of quality of life related personal outcomes (Gómez et al. 2013)—measured by the GENCAT Scale (Verdugo et al. 2010)—and showed significant differences in quality of life scores among different diagnostic groups (i.e. people with physical disabilities, people with intellectual disabilities, elderly, people with mental health problems, and people with chemical dependency), as well as the need for public and social policies to focus on the improvement of personal outcomes especially related to personal development, social inclusion, and self-determination—results that are consistent with those found in other studies (Bonham et al. 2001, 2011; Bouffard 2012; Emerson et al. 2001; Perry and Felce 2005). Actually, this study (Gómez et al. 2013) was the antecedent of the present one, given that it aroused our interest of taking into account the influence that organizational or service structures might have on personal outcomes, and how these organizational characteristics might be related to individual characteristics that jointly impact individual outcomes.

Therefore, the general goal of this study is to examine the influence of different types of human services in the quality of life of their nested users. The research questions to test are specifically: (a) the type of services that influence the quality of life level of its users; and (b) how personal variables and organizational variables exhibit a different level of influence on users' quality of life. To answer these questions, different multilevel models will be built to test significant differences not only in the total quality of life score, but also in each of the core eight domains. Kim (2009) pointed out that, on the one hand, if data are aggregated to higher or macro level units (i.e. kinds of services), much of the variability at the lower or micro level (i.e. clients) can be lost, and the power of statistical analyses decreases; on the other hand, if data are disaggregated to the lower level, then the observations are falsely treated as independent even though observations from the same higher level units tend to be more alike. Ignoring the dependencies among observations within clusters generally leads to standard errors that are underestimated and significant results (Kish 1965, 1987).

For this reason, to achieve the research goal, multilevel models—also known as Hierarchical Linear Models or Mixed Effects Models (Goldstein 2003; Raudenbush and Bryk 2002; Snijders and Bosker 1999)—were used as a powerful tool for statistical analysis in the presence of clustered hierarchical data structures (in this case, clients nested within specific types of services) that provides more accurate modeling of complex systems because they combine different levels in a single analysis (Vallejo et al. 2008), and allow us to better understand the different sources of variability across levels of the hierarchical structure and their relevant predictors in each level (Heck and Scott 2000).

## 2 Methods

### 2.1 Participants

The present study was carried out in 288 social and human services in Catalonia (Spain) providing services to 11,624 clients in the sample. Respondents were professionals who knew the participants for at least three months and had had recent opportunities to observe them in different environments and for substantial periods of time. A required criterion to participate in the evaluation was that the respondent carefully read the administration procedures in the manual that included information about the quality of life model being used in our study.

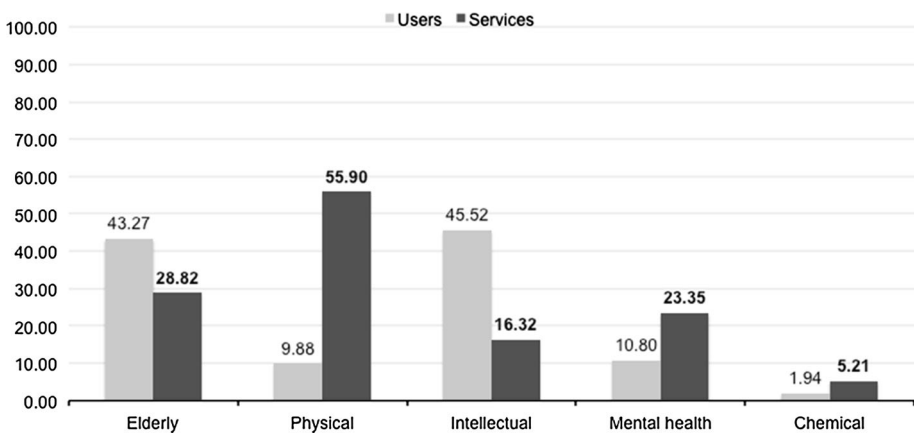
Participants whose quality of life was assessed were quite balanced according to their gender: 54.8 % ( $n = 6,372$ ) were females. Their ages ranged from 16 to 111 years old ( $M = 59.37$ ;  $SD = 23.82$ ), although the mean age of women ( $M = 66.70$ ;  $SD = 23.67$ ) was higher than the mean age of men ( $M = 50.49$ ;  $SD = 20.67$ ). Concerning the diagnostic group, 42 % participants were considered elderly (73.8 % were female), 45.5 % showed intellectual disability (58 % were male), 10.8 % had mental health problems (60 % were male), 9.9 % had physical disability (52 % were female), and 21.9 % had chemical dependency (83 % were males).

The distribution was well balanced in relation to the different kinds of funding: 45.14 % of services were private, 20.14 % were public, and 34.72 % combined public and private funds. The mean number of assessed people per center was 40 (*range* 1–424) and the median was 28 (*inter-quartile range* 39, *quartile deviation* 19.5). It should be noted that an individual might be part of different diagnostic groups (e.g. having intellectual disability, a physical disability, and mental health problems) and also a service might attend to people with different diagnoses (e.g. a service for people with intellectual disabilities providing support to an elderly person with intellectual and physical disabilities). Figure 1 shows the percent of participants by diagnoses (i.e. individual characteristic) and by type of services in terms of the main population they attend (i.e. organizational variable).

## 2.2 Variables and Measurement Instruments

Data were collected for two levels of analysis: users of services at level one (i.e. individual variables) and type of services at level two (i.e. main population to which their services are addressed as an organizational variable).

On the one hand, among individual variables, the following were measured: (a) *gender* (0 = men; 1 = women); (b) *age* was centered on its mean; (c) *diagnoses*, considered as dichotomous variables (presenting = 1; not presenting each specific diagnosis = 0; i.e. elderly, intellectual disability, physical disability, mental health problems, chemical dependency). On the other hand, as an organizational variable, the *type of service* in terms of attended population considered as a dichotomous variable (receiving = 1; not receiving each specific service = 0) was introduced in the analyses: services for elderly people, for



**Fig. 1** Percent of users and services. *Note.* *Physical* physical disability, *Intellectual* intellectual disability, *Chemical* chemical dependency

people with intellectual disability, for people with physical disability, for people with mental health problems, and for people with chemical dependency.

Finally, the assessment of quality of life was carried out through the administration of the GENCAT Scale (Verdugo et al. 2010), which assesses the eight domains of the previously referenced quality of life conceptual model. This is an instrument that allows for assessing quality of life related personal outcomes. A third party respondent bases the assessment on a systematic observation and a deep knowledge of the person. Its 69 items are formulated as third-person statements with four frequency options (i.e. “never or hardly ever,” “sometimes,” “often,” “always and almost always”). Psychometric qualities of this scale in the original study of validation include ( $N = 3,029$ ) (Verdugo et al. 2010): (a) reliability: evaluated by Cronbach’s alpha index ( $\alpha = .92$ ); (b) construct validity: evaluated by means of Confirmatory Factor Analysis ( $\chi^2/df = 2.87$ ; TLI = .95; CFI = .97; RMSEA = .05). The psychometric properties of the scale in the present study ( $N = 11,624$ ) also provide adequate evidence of: (a) reliability: evaluated by Cronbach’s alpha index ( $\alpha = .93$ ); (b) construct validity: evaluated by means of Confirmatory Factor Analysis ( $\chi^2/df = 26.16$ ; TLI = .98; CFI = .99; RMSEA = .05). Total quality of life score and scores in each of the eight domains were used as dependent variables.

### 2.3 Procedure

Organizations providing social and human services in Catalonia were contacted via e-mail describing the aims of the research and estimating the number of centers that were anticipated being involved. Data were collected through a Web application that comprised a sociodemographic survey about the human service (completed only once by each organization), a sociodemographic survey focused on the individual characteristics, and the GENCAT Scale (both completed for each service user participating in the study). The Web application provided feedback to its users by showing a table with the raw scores obtained in the scale by the people assessed, but also their corresponding standards and percentiles.

This study was approved by the ethics committee at the University of Salamanca (Spain) and has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The manuscript does not contain clinical studies, patient data, or details that might disclose the identity of the participants. Anonymity of the participants in this study was guaranteed and their informed consent was obtained.

### 2.4 Data Analyses

The full multi-level regression model assumes that there is a hierarchical data set with one single dependent variable that is measured at the lowest level and explanatory variables at all existing levels. Conceptually, the model can be viewed as a hierarchical system of regression equations. In this study, it is assumed that data at organizational or service level have been collected through the assessment of quality of life related personal outcomes of those receiving services. At the individual or user level, quality of life is treated as a dependent variable and individual explanatory characteristics (i.e. gender, age, and diagnostic group) were introduced into the regression model.

Multi-level analysis allows the simultaneous examination of the effects of group-level and individual-level variables accounting for non-independence of observations within groups but also allows us to treat groups as related but coming from a larger population. In this way, it permits the simultaneous analysis of individual and groups at the microsystem

and mesosystem levels, respectively. In this study, individual variables of social service users (level 1: gender, age, diagnoses) were examined together with organizational or service variables (level 2: types of services).

IBM SPSS Statistics using the SPSS mixed procedure (Peugh and Enders 2005) with Restricted Maximum Likelihood was used to estimate the parameters. Analysis began using a null model with only the constant term in the fixed and random parts. The null model was used to compute the Intra-class Correlation Coefficient ( $\rho$ ), which is the proportion of variability in outcomes (total quality of life score and scores in the eight quality of life domains) that exists between level two units (i.e. types of services). This statistic, together with Wald's Z test, justifies the use of a multilevel analysis. Once the multilevel structure was justified and with the goal of explaining differences in quality of life, a model with individual characteristics was introduced, followed by the introduction into the analyses of a model including types of services. Finally, individual and service variables were introduced into a single model. These steps were used for both the general score as well as for the eight quality of life domains.

Multi-level models are also named mixed effects models because they contain both fixed and random effects. The fixed effects (i.e. with no random component at the group level) constrain the macro errors of some of the coefficients to be 0 and they are analogous to standard regression coefficients and estimated directly. The random effects are not directly estimated but summarized in terms of their estimated variances and covariances. The models used in this study had a fixed part that is unchanging across groups (i.e. the slope of the predictor variables) and a random part (i.e. the intercept in every model or variances in every level). The probability of Type I error was set to .05 when the significance of Wald Z and predictors variables were examined.

### 3 Results

#### 3.1 Null Multilevel Model

Before starting to model the predictor variables for levels 1 and 2, the null models were estimated for the total score and for the eight domains. The analyses of the null multilevel model revealed that 27.46 % of the variance in the total score, 12.81 % of the variance in emotional wellbeing, 20.38 % in interpersonal relationships, 20.09 % in material wellbeing, 30.44 % in personal development, 27.20 % in physical wellbeing, 32.88 % in self-determination, 29.93 % in social inclusion, 43.29 % in rights was due to the type of service that users attended. In Table 1, deviance statistic terms, Wald test and components of variance are presented. All Wald tests were significant for the total score and for the scores in the eight domains, which meant the use of multilevel analyses was appropriate and justified.

#### 3.2 Level 1 Model: Users (Individual Characteristics)

After checking that multilevel structure was justified the next step consisted of explaining the differences in total scale score as well as in each domain score, individual characteristics were introduced. The fixed effect output indicated that the overall service mean for quality of life was 195.23 (scores could range from 69 to 276) after controlling for all variables at level one. The analysis indicated that all variables were relevant predictors of quality of life total overall score ( $p < .001$ ), except people with intellectual disability and people with chemical dependency variables ( $p > .05$ ).

**Table 1** Wald Z test and components of the variance in the null model

	Total	EW	IR	MW	PD	PW	SD	SI	RI
<i>Wald Z test</i>									
Level-1	75.71	75.70	75.70	75.73	75.72	75.72	75.72	75.72	75.73
Level-2	8.10	7.34	7.81	7.99	8.21	8.14	8.28	8.16	8.43
<i>p</i> value	.00	.00	.00	.00	.00	.00	.00	.00	.00
<i>Components of variance</i>									
Level-1	515.99	22.33	20.67	7.59	19.79	8.13	39.66	13.04	10.58
Level-2	195.34	3.28	5.29	1.91	8.23	3.04	19.43	5.57	8.07
$\rho$	.27	.13	.20	.20	.30	.27	.33	.30	.43
Deviance	106,063.35	69,432.91	68,612.12	56,965.92	67,580.36	57,814.540	76,279.217	63,328.726	60,980.807
<i>df</i>	3	3	3	3	3	3	3	3	3

*Total* global scale, *EW* Emotional wellbeing, *IR* interpersonal relationships, *MW* material wellbeing, *PD* personal development, *PW* physical wellbeing, *SD* self-determination, *SI* social inclusion, *RI* rights,  $\rho$  intra-class correlation coefficient, *df* degrees of freedom

Concerning scores in the eight domains, gender, the diagnosis of elderly, physical disability, and health mental problems were significant variables for emotional wellbeing; age, intellectual disability, and health mental problems were predictors of interpersonal relationships; age, physical disability, mental health, and chemical dependency were relevant for material wellbeing; age, elderly, physical disability, and mental health problems were significant variables in personal development; gender, physical disability, intellectual disability, mental health problems, and chemical dependency problems were relevant variables for physical wellbeing; these same variables (except gender and chemical dependency) were also relevant for social inclusion; gender, age, elderly, intellectual disability, and chemical dependency were significant variables for self-determination; and gender, intellectual disabilities and chemical dependency variables were predictors of rights. In other words, having mental health problems was a significant indicator for all domains while being elderly was only a significant variable for emotional wellbeing, personal development, and self-determination.

### 3.3 Level 2 Model: Services (Organizational Variable: Type of Service)

With regard to service level variables, significant differences were found for all types of services ( $p < .001$ ), with the only exception of those services that are focused on people with mental health problems ( $p > .05$ ). Concerning the eight domains, all variables were significant for self-determination, social inclusion (except intellectual disability services), rights (except services for elderly people), material wellbeing and personal development (except mental health services for both previous cases). In addition, services for elderly and mental health were significant predictors for emotional wellbeing, physical disability services were relevant for interpersonal relationships, and mental health services were significant for physical wellbeing.

### 3.4 Final Model: Users (Individual Characteristics) and Services (Organizational Variable: Type of Service)

Prior to generating the final model, different interactions between variables were tested. More specifically we tested the three relationships that were significant in a previous total score model (overall mean score in quality of life). This model included level 1 and 2 variables, and the interactions between significant variables: users  $\times$  services for elderly; elderly users  $\times$  age; and users  $\times$  services for people with intellectual disability). Results indicated that the interaction between users and services for people with intellectual disability was statistical significant ( $p < .01$ ) and this interaction was maintained for the final model of quality of life total score and every final model with the eight domain scores.

The fixed effect output indicated that the overall mean score for services was 198.61 (scores could range from 188.12 to 209.11) after controlling for the effect of all variables (see Table 2). The model predicted higher quality of life for men ( $\beta = 2.25$ ;  $S.E. = 0.49$ ) and lower quality of life for those who were elderly ( $\beta = -0.215$ ;  $S.E. = 0.10$ ). Taking into account the diagnostic groups (i.e. categorical variables coded as 0 for non users and 1 for users), presenting intellectual disability and mental health problems were significant predictors at user level: people without intellectual disability were predicted to obtain a mean of 204.52 ( $\beta = 5.91$ ;  $S.E. = 1.48$ ) and those without mental health problems were predicted to score 208.20 ( $\beta = 9.59$ ;  $S.E. = 1.18$ ). Therefore, intellectual disability or mental health problems were predictors of lower quality of life scores. At services level, services for elderly people and those for people with mental health problems were



**Table 2** One level and two level models: total score

Fixed effects	Coefficient	<i>S.E.</i>	<i>t</i>	<i>df</i>	<i>p</i> value
Intercept	198.61	5.35	2,215.73	37.11	.00
Man	2.25	0.49	10,199.16	4.64	.00
Centered age	-0.21	0.10	10,268.57	-2.16	.03
<i>User level</i>					
Elderly	2.11	1.79	10,301.78	1.18	.24
Physical disability	1.04	1.11	9,997.34	0.94	.35
Intellectual disability	5.91	1.48	10,217.74	3.99	.00
Mental health problems	9.59	1.18	10,221.82	8.14	.00
Chemical dependency	0.60	3.64	6,695.43	0.17	.87
<i>Service level</i>					
Elderly	6.76	2.32	315.78	2.91	.00
Physical disability	-2.79	1.47	2,876.95	-1.90	.06
Intellectual disability	0.99	2.62	6,781.90	0.38	.71
Mental health problems	-3.77	1.42	3,028.21	-2.65	.01
Chemical dependency	-4.95	4.25	1,022.50	-1.16	.25
ID users × services	7.30	2.56	10,303.89	2.84	.00
Random effects	Component of variance	Wald Z	<i>p</i> value	95 % Confidence interval	
				Lower bound	Upper bound
Users	508.10	71.24	.00	494.31	522.27
Services	169.77	7.84	.00	132.24	217.96
Deviance (d.f.)	93,998.815 (16)				

*S.E.* standard error, *df* degrees of freedom, *ID* intellectual disability

The parameters of diagnostic groups or type of users are set at zero (not presenting each specific diagnosis: elderly, intellectual or developmental disability, physical disability, persons with mental health problems, and person with chemical dependency)

significant predictors for the total quality of life score. Those services providing supports to people with mental health problems were predicted 3.77 points more (*S.E.* = 1.42), while those services that are focused on elderly people showed lower scores with 6.76 points less (*S.E.* = 2.32).

Results of these analyses by domains are shown in Table 3. At users' level, gender showed a significant effect in emotional wellbeing, physical wellbeing, self-determination, and rights: being male was a predictor of higher scores for these domains. Age also showed a significant effect for interpersonal relationships, material wellbeing, personal development, self-determination, and social inclusion. However, in this case, the effect was negative and then predicting lower scores in these domains with the only exception of material wellbeing for which age was a predictor of a higher score ( $\beta = 0.05$ ; *S.E.* = 0.01). Regarding the diagnoses, a significant negative effect (i.e. it was a predictor of lower scores) was found for elderly users only in personal development; for people with physical disability in emotional wellbeing and physical wellbeing; for people with mental health problems in all domains; for people with intellectual disability in personal development, self-determination, rights, and social inclusion (while significantly greater scores were predicted in physical wellbeing); and for people with chemical dependency in

**Table 3** One level and two level models for the eight domains: fixed effects

	EW		IR		MW		PD		PW		SD		SI		RI	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Intercept	19.52	1.01	26.71	1.04	26.10	0.63	19.12	1.02	25.53	0.69	24.29	1.47	22.52	0.88	35.12	0.78
Man	0.62**	0.10	0.13	0.10	0.06	0.06	0.13	0.09	0.18**	0.06	0.73**	0.13	0.04	0.08	0.37**	0.07
Age	0.01	0.02	-0.06**	0.02	0.05**	0.01	-0.07**	0.02	-0.01	0.01	-0.05**	0.03	-0.08*	0.02	0.00	0.01
<i>Users</i>																
Elderly	-0.15	0.37	0.11	0.36	0.19	0.13	1.13**	0.34	0.42	0.22	-0.09	0.49	0.19	0.29	0.18	0.25
Physical	0.55*	0.23	-0.15	0.22	-0.10	0.18	-0.20	0.21	0.77**	0.14	-0.44	0.30	0.24	0.18	0.00	0.16
Intellectual	-0.055	0.30	0.53	0.29	0.75	0.14	1.30**	0.28	-1.06**	0.19	3.27**	0.41	0.50*	0.24	1.99**	0.21
Mental health	2.58**	0.24	2.08**	0.23	1.19**	0.44	1.18**	0.22	1.00**	0.15	.93**	0.32	0.66**	0.19	0.39*	0.17
Chemical	0.74	0.72	-0.31	0.72	0.19**	0.13	0.62**	0.69	0.93*	0.46	-2.11**	1.00	-0.28	0.59	-0.53	0.52
<i>Services</i>																
Elderly	1.58**	0.44	-0.31	0.72	-0.37	0.27	2.96**	0.44	-0.63**	0.30	2.84**	0.64	0.13	0.38	0.38	0.34
Physical	-0.25	0.28	-0.07	0.45	0.30	0.17	-0.35	0.28	-0.12	0.19	-1.20**	0.40	-0.16	0.24	-0.62**	0.21
Intellect.	-0.68	0.52	-0.44	0.29	-0.63**	0.31	0.69	0.50	-1.75**	0.33	2.27**	0.72	-0.45	0.42	2.13**	0.38
Mental health	-0.32	0.27	-0.65	0.52	-0.16	0.17	-0.44	0.27	0.80**	0.18	-2.19**	0.39	0.03	0.23	-1.11**	0.21
Chemical	-0.33	0.76	-0.44	0.28	1.00**	0.49	-2.01**	0.81	0.00	0.56	-2.85*	1.16	0.29	0.71	-1.22*	0.63
ID user × service	1.71**	0.53	0.50*	0.81	0.58	0.31	1.06**	0.49	1.27**	0.32	0.60	0.71	1.74**	0.41	-0.76*	0.36

Physical disability, Intellectual intellectual disability, Chemical chemical dependency, Intellect. ID user × service interaction between intellectual disability users and services, Coeff. coefficient, S.E. standard error

\*  $p \leq .05$ ; \*\*  $p \leq .001$ . The parameters of diagnostic groups or type of users are set at zero (not presenting each specific diagnosis)

material wellbeing, physical wellbeing, personal development [while significantly greater scores were predicted in self-determination: clients who did not show chemical dependency were predicted 2.11 points lower ( $\beta = -2.11$ ;  $S.E. = 1.00$ )].

At services' level, those focused on elderly people were predictors of significantly lower scores in emotional wellbeing, personal development, and self-determination, while they were predictors of higher scores in physical wellbeing ( $\beta = -0.63$ ;  $S.E. = .30$ ). Those services providing supports to people with physical disability showed a significant effect in self-determination and rights: higher scores in both domains were predicted ( $\beta = -1.20$  and  $\beta = -0.62$ , respectively). Being a service specialized in intellectual disability was revealed as a predictor of significantly higher scores in material wellbeing and physical wellbeing, while it was a predictor of significantly lower scores in self-determination and rights. In this case, a significant interaction effect was found (users with intellectual disability and receiving supports in services specialized in intellectual disability) for most of the eight domains (this was not the case for self-determination and material wellbeing): both conditions were predictors of lower scores with the only exception of rights for which greater significant scores were predicted. Services attending to people with mental health problems predicted significantly higher scores in self-determination and rights ( $\beta = -2.19$  and  $\beta = -1.11$ , respectively), while lower scores were predicted for physical wellbeing ( $\beta = 0.80$ ). Finally, significantly higher scores were found for those services for people with chemical dependency in personal development, self-determination, and rights, while lower scores were predicted in material wellbeing.

For the total quality of life score, the reduced unexplained variance (i.e. variance comes from null level) is 1.53 % at user level and 13.09 % at service level. By domains, personal development was the domain reducing variance the best (7.33 %) at level one, while rights, self-determination, and personal development reduced most of the unexplained variance at level two (46.47, 36.39, and 24.30 %, respectively). In contrast, this variance is only reduced 0.13 % in material wellbeing at user level and 0.33 % in physical wellbeing at service level. The reduced proportions of unexplained variance are presented in Table 4.

## 4 Discussion

Social research regularly involves the study of the relationship between individuals and society. The general concept is that individuals interact with the social contexts to which they belong, that individual persons are influenced by the social groups or contexts to which they belong, and that those groups are in turn influenced by the individuals who make up that group. The individuals and the social groups are conceptualized as a hierarchical system of individuals nested within groups, with individuals and groups defined at separate levels of this hierarchical system, for example students are nested within schools, patients are nested within clinics, or employees are nested within organizations. The multi-level model approach, in comparison to other statistical models such as linear regression models, allows for dealing with the relationships between clients and organizations from a contextualized perspective and, therefore, from a more realistic perspective. Multi-level models allow researchers to recognize analyses units or levels, to measure the effect of variables and explore their relationships at different levels, and to detect different sources of variation through different levels and thorough different predictor variables that can be progressively included (Kim 2009).

The results of this study constitute valid and powerful evidence of how differences in quality of life-related personal outcomes are significantly influenced by individual and

**Table 4** One level and two level models for the eight domains: random effects

	EW	IR	MW	PD	PW	SD	SI	RI
<i>Level 1: users</i>								
$\tau_0^2$	21.79	20.25	7.58	18.34	7.92	38.47	12.92	10.23
Z wald test	71.22	71.23	71.26	71.25	71.17	71.26	71.24	71.23
<i>p</i> value	.00	.00	.00	.00	.000	.00	.00	.00
Lower Bound	21.20	19.70	7.37	17.85	7.70	37.43	12.57	9.95
Upper Bound	22.40	20.82	7.79	18.86	8.14	39.54	13.28	10.52
<i>Level 2: services</i>								
$\sigma_j^2$	3.21	5.14	1.78	6.23	3.03	12.36	5.48	4.32
Z wald test	7.06	7.59	7.72	7.90	7.56	7.95	8.00	7.87
<i>p</i> value	.00	.00	.00	.00	.00	.00	.00	.00
Lower Bound	2.43	3.97	1.38	4.86	2.69	9.66	4.29	3.36
Upper Bound	4.24	6.66	2.29	7.98	4.53	15.81	7.01	5.54
Deviance ( <i>df</i> = 16)	61,427.27	60,743.25	50,601.23	59,764.08	51,141.26	67,390.66	56,179.47	53,775.563
<i>Percentage reduction in variance statistics</i>								
Between users	2.42	2.03	0.13	7.33	2.58	3.00	0.92	3.31
Between services	2.13	2.84	6.81	24.30	0.33	36.39	1.62	46.47

*EW* emotional wellbeing, *IR* interpersonal relationships, *MW* material wellbeing, *PD* personal development, *PW* physical wellbeing, *SD* self-determination, *SI* social inclusion, *RI* rights, *df* degrees of freedom

environmental/organizational variables. In this study, first we have justified a multilevel structure to explain differences in quality of life not only by individual characteristics such as gender, age, and diagnosis (i.e. intellectual disability, physical disability, elderly, mental health problems, and chemical dependency), but also by organizational characteristics such as the type of services in terms of the main population they support.

Next, we addressed the research question related to personal variables and type of service exhibiting a different level of influence on quality of life related personal outcomes. In this sense, relevant variables for user and services levels have been revealed as significant. More specifically, when two levels are included in the same analysis, results revealed that being a man, ageing, having intellectual disability, and showing mental health problems are relevant predictors of overall quality of life scores: greater scores for men, lower scores for the next three variables. With regards to scores in the eight domains, the role mental health problems plays must be highlighted given that it shows up as a significant predictor for lower scores in all domains, while being an elderly person seems to be a significant variable only in the case of personal development (for which lower scores are predicted).

At service level, all types of services are relevant in the case of self-determination (predicting greater scores for those addressed to people with physical disabilities, mental health problems, and chemical dependency; on the contrary, predicting lower scores for those addressed to elderly people and intellectual disability). These results are consistent with previous studies using more traditional statistical methods that have found significant differences in individual characteristics scores and organizational variables (Cherepanov et al. 2010; Claes et al. 2012; Gómez 2014; Gómez et al. 2013; Gardner and Carran 2005). In a similar way, the relevant role that personal development, self-determination, and rights play in reducing unexplained variance in comparison to the other domains is also consistent with other studies (Wehmeyer and Garner 2003; Bonham et al. 2001; Navas et al. 2012; Reinders and Schalock 2014; Verdugo et al. 2012).

Given that personal characteristics are stable and cannot be changed in most cases, the results of this study lead to practical implications for services providing support to these populations, especially for those interested in managing, assessing, and improving quality of life related personal outcomes at users level as well as quality enhancement at an organizational level. These results provide evidence that one's quality of life can be enhanced through quality enhancement strategies that encompass personal involvement, individualized supports, and personal growth opportunities.

We have proved that, once personal characteristics have been controlled, significant differences in quality of life are related to types of services that might vary according to multiple different variables such as size, organization culture, incomes, accessibility, level of personal involvement of their clients, level of personal growth opportunities, individualized supports, and others. One of the greatest challenges that quality of life researchers will face in the future will be identifying the most relevant organizational and service variables, as well as the role that they play in the quality of life related personal outcomes of service users. This work will be facilitated thanks to the availability of heuristic quality of life theoretical frameworks—like the one used in this study—that clearly identify the dependent variable to be assessed (i.e. quality of life domains) and operationally define the specific moderator and mediator variables that potentially impact the quality of life domains.

The results obtained in this study are descriptive but not proscriptive or causal. In order to move us towards an explanatory model of quality of life that establishes causal relationships among variables, next steps and efforts in this approach to outcomes research should be focused on the specification of moderator and mediator variables that might have

a significant impact on quality of life scores (Gómez et al., in preparation). As it is known, a moderator is a factor that alters the relationship between two variables and thus modifies the form or strength of the relationship between the two variables, while a mediating factor influences the relation between the independent variable and outcome and exhibits indirect causation, connection, or relation (Farmer 2012; Frazier et al. 2004). Moderator factors found in the scientific literature include the level of personal involvement of clients and the level of personal growth opportunities that are provided, while examples of mediators include individual supports and kind of services that are provided (Schalock et al., submitted). In this quantitative perspective to empirically testing the relationship between variables and their potential role as mediators or moderators, two statistical methods are highly recommend: partial least square (PLS) regression, a very powerful and versatile data analytical tool used as a first step to understanding the existing relations (Rosipal and Krämer 2006) and structural equation modeling (SEM), that allows both confirmatory theory testing and exploratory modeling of theory development (Bollen 1998).

**Acknowledgments** Catalan Welfare and Social Services Institute (ICASS, Generalitat of Catalonia) together with the Ministry of Economy and Competitiveness (R&D Projects, 2012) (PSI2012-33139) (PSI2012-36278) have funded this work.

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