

# Validity and reliability of a new instrument for the evaluation of dental collaboration in disabled people

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## ABSTRACT

**BACKGROUND:** nowadays, oral health in people with disabilities is an important topic. The psychological and behavioural problems of these people, their difficulties with environmental adaptations and the absence of any traditional communication determine the compliance needed for treatment. The aim of this work was to test the validity and reliability of an original questionnaire that could become an instrument assessing the individual features in people with mental retardation and other developmental disabilities at the time of dental treatment.

**METHODS:** it was created a questionnaire with standardised answers regarding four specific areas: neuropsychology, emotional-affect, autonomy and environmental resources. The questionnaire was completed by 63 patients from three different institutes (two rehabilitation institutes and an Institute of Dentistry for patients with special needs). To analyse the answers, each item was transformed into a numeric value. A value of 1 was displayed as the minimum while 4 represented full possession of the considered skills. A total of 17 variables were analysed with descriptive statistics and multivariate analysis. Internal consistency reliability was measured using Cronbach's alpha. Furthermore, an analysis on convergent/discriminant validity was provided.

**RESULTS:** all variables were positively correlated. The most significant were "guidance", "communication", "sociability", "view", "hearing" and "feeding". Items like "self-control", "equanimity", "problematic behaviour", "extroversion" and "autonomy" offered vague and less significant information in identifying the patient's collaboration level. Variables like "evaluation by the compiler about the patient's collaboration", "previous dental experiences" and "attendant" were confirmed. Cronbach's alpha was 0.77 (standardized result), which meet the *a priori* criterion of  $0.90 \geq \alpha \geq 0.70$ .

**CONCLUSIONS:** the instrument was statistically tested and seems to be adequate to estimate the collaboration level of disabled patients. It is called CLEQ (Collaboration Level Evaluation Questionnaire). Further trials are warranted to confirm its validity and benefits.

*Key words:* Collaboration; Oral health; Disabled people; Dental treatment

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## INTRODUCTION

People with serious mental retardation receive, generally, little academic attention. Although they represent approximately 3.5% of the population, they include subcategories that are often neglected by research studies [1].

Up to 40% of people with serious mental retardation are bedridden or have serious difficulties with walking [2]. Furthermore, they often have sensory deficits and/or skeletal anomalies in addition to self-destructive behaviours [3].

These data explain the international growing interest in the health of disabled people and the economic and social planning of health care towards them. Diseases affect often disabled people in more aggressive and virulent ways than non-disabled since their reduced autonomy.

Some studies showed the large number of general health problems in disabled people compared with the rest of the population. Many of these diseases may not have been recognised as such or dealt with properly [4, 5].

In dentistry, the need for oral health in disabled is not always met.

In people with mental retardation and other developmental disabilities, the demand for dental assistance is both latent and underestimated. This problem is also due to difficulties associated with access to public health services and outpatient treatment.

The psychological and behavioural problems, the difficulties in environmental adaptation and the absence of any type of traditional communication determine the physical or mental abilities of these individuals to collaborate with dentists.

The following factors could be present:

- the inability of the patient to cooperate (voluntary or involuntary);
- the inability to maintain a proper posture during treatment;
- the psychological attitudes of the patient or of his relatives;

Evaluating the cooperation level of the patient during treatment, the operator may also distinguish the gravity of the disability.

The acquaintance of cooperation is an important factor to improve the use of time, resources and personnel necessary for treatment.

The evaluation of the collaboration level expresses a new concept for the management of dental services.

The aim of this work was to test the validity and reliability of an original questionnaire that could become an instrument assessing the individual features in people with mental retardation and other developmental disabilities at the time of dental treatment.

## METHODS

The standardization of the questions and answers is important to ensure the comparability of the data and statistical analysis.

To identify which areas were closer to the concept of collaboration, three instruments known in the scientific literature were considered:

- the Grauer scale, used for geriatric age [6];
- the QVCE, evaluating emotional aspects in subjects without language capacity and with severe mental retardation [7];
- the SDAI scale, used in the detection of careless behaviour and hyperactivity [8].

The first characteristic of the abovementioned tools was the search for a clear and shared language.

A synoptic comparison of these scales identified specific interest areas, such as personal autonomy, management of emotions, health, motility, quality of life, problematic behaviours, cognitive aspects and social skills.

Three profile fields were identified: neuropsychological (e.g., language, perceptive and cognitive functionality), affective-emotional (e.g., mood, anxiety, depression and stress) and autonomy-drive (e.g., guidance in space and time). For each field, the most significant items were identified.

In order to obtain useful information to define the cooperation, history of the disabled patient, including the person who accompanies him, were considered.

It may also be useful to know the outcomes of past dental visit experiences.

These information were grouped into a fourth area called environmental resources.

The instrument was validated through 63 questionnaires, administered in three different structures: two rehabilitation institutes and a Public Institute of Dentistry for disabled people.

All the questionnaires were completed by a single interviewer that administered the

questions to patient (in the rare cases in which he was able to respond), to accompanying relative, or to service personnel.

To analyse the answers, each item was transformed into a numeric value.

A value of 1 was displayed as the minimum while 4 represented full possession of the considered skills.

17 variables were analysed individually using descriptive statistics: 14 were included in Table 1, the remaining ones are sex, age and institution. Finally, the variables were tested with multivariate analysis to identify relationships between the various items.

Internal consistency reliability evaluates the extent to which related items measures the same concept. It is measured using Cronbach's alpha that represents the degree to which items within a scale are inter-correlated with one another. Statistically, it is based on the sum of the variances of the items divided by the variance of the scale. Cronbach's alpha typically ranges from 0 to 1. Internal-consistency reliability is usually considered to be acceptable when Cronbach's alpha  $\geq 0.70$ . Internal consistency is relevant only for multi-item scales (as in our framework). In fact, a low value of alpha could be due to a low number of questions, poor interrelatedness between items or heterogeneous constructs. Similarly, if alpha is too high it may suggest that some items are redundant as they are testing the same question but in a different guise. A maximum value of 0.90 has been recommended.

Furthermore, we provide an analysis on convergent/discriminant validity. The analysis is based upon hypothesis regarding which items should be associated to each other and which should not be. To provide insights on this point, it is often easiest to provide a full correlation matrix of all the scale scores and then highlight which ones did or did not meet the *a priori* hypothesis.

## RESULTS

The sample consisted of both children and adults and elderly. The analyzed disability involved both neurological and psychophysical deficits. No socioeconomic variables were considered.

64.4% of the people were children or young people, 50.79% were males and 47.62% females.

The samples of detection were more represented by neurological deficits than by

autonomy-drive deficits. The uncooperative patient usually belonged to the first group.

The first requested information was the capacity of the patient to have functional interactions with the environment ("guidance"). Only 17.46% forgot faces or familiar environments.

The "demand for functional communication" showed that this difficulty was significant in 38.09% of the people and that 22.22% did not communicate at all.

The analysis of the age distribution showed that cases with scores of 1 and 2 were focused in the group aged less than 16 years old, while the indicator of adequate communication (value 4) was more common in adult people; the trend also showed that females had more communicative skills than males.

The variable "concerning the control of waiting time" indicated that more than 50% of the sample could not manage their anxiety.

The analysis of the variable "concerning the desire to do things assessed their emotional state" showed that the percentage of absent and passive patients was almost 40%.

For the variable "sociability", 41.27% of people presented problems with getting in touch with others.

Approximately 62% of people did not express problems with aggressiveness in the past, while 2% were declared aggressive.

The last aspect of the affective-emotional profile, concerning "humour or extroversion", showed that 40% of patients have a high degree of extroversion and interest for other people.

Another variable offered a range of information about "displacement and autonomy skills": 59% needed assistance for movement, while 27% were absolutely independent.

Half of the sample had serious eyesight problems, while hearing function problems were 22%.

65% of the sample had chewing problems and were not self-sufficient with feeding.

Another variable was a subjective assessment of patient cooperation and the distribution analysis suggested that approximately 60% of the cases did not always collaborate.

3% of the sample never received dental treatments. Negative dental experiences were associated with 37% of the sample.

The linear correlation analysis showed interesting results.

TABLE 1

PERCENTAGES OF VALIDITY OF VARIABLES FROM 1 TO 14							
	VARIABLE NUMBER	VARIABLE	NOT AT ALL*	SOMETIMES	ALMOST ALWAYS	ALWAYS	NOT INDICATED
He can identify people and can orient oneself in space and time	1	Space-time cognitive aspects	12.70%	4.76%	22.22%	60.32%	0.00%
He communicates in appropriate and functional ways	2	Communicative functional aspects	22.22%	15.87%	14.29%	47.62%	0.00%
He has good control during periods of waiting	3	Emotional aspects, management of anxiety	20.63%	9.52%	19.05%	50.80%	0.00%
He is sad this week and has little desire to do things	4	State of humor	14.29%	9.52%	17.46%	58.73%	0.00%
He has good relationship with others	5	Sociability	12.70%	6.35%	22.22%	58.73%	0.00%
Aggressive behaviour towards persons or things	6	Problematic behaviour	1.59%	11.11%	25.40%	61.90%	0.00%
He is peaceful and friendly	7	Extroversion and serenity	7.94%	15.87%	33.33%	42.86%	0.00%
He is cooperative	12	Cooperation	23.81%	17.46%	17.46%	41.27%	0.00%
		VARIABLE	DEPENDS COMPLETELY FROM THE OTHER	NEEDS HELP	AT TIMES NEEDS AIDS	AUTONOMOUS	NOT INDICATED
He moves independently and has no problems with posture	8	Indipendence	58.73%	6.35%	7.94%	26.98%	0.00%
		VARIABLE	DOES NOT SEE	DISTINGUISHES LIGHTS AND SHADOWS	DISTINGUISHES FACES	SEES WELL	NOT INDICATED
Visual impairments even with lenses	9	Visual functionality	15.87%	6.35%	26.98%	50.80%	0.00%
		VARIABLE	DOES NOT HEAR	FEELS SOME VERY STRONG NOISES	HEARS HIGH VOICES	HEARS WELL	NOT INDICATED
Auditory problems	10	Auditory function	9.52%	3.18%	9.52%	77.78%	0.00%
		VARIABLE	DOES NOT CHEW, NEEDS HELP WITH EATING	NEEDS HELP WITH EATING BUT CAN CHEW	EATS FOOD THAT IS CRUMBLD AND IS SELF-EMPLOYED	SELF-EMPLOYED	NOT INDICATED
He eats in an appropriate way any type of food	11	Feeding	26.99%	17.46%	20.63%	34.92%	0.00%
		VARIABLE	NEVER BEEN TO THE DENTIST	NEGATIVE EPISODES	SOMETIMES HAS HAD PROBLEMS	HAS NOT HAD ANY PROBLEMS	NOT INDICATED
He had other dental experiences without problems	13	Previous experience with the dentist	3.17%	36.51%	23.81%	36.51%	0.00%
		VARIABLE	UNRELATED PERSON THAT DOES NOT TAKE CARE OF HIM	FAMILY PERSON THAT DOES NOT TAKE CARE OF HIM	ASSISTANT THAT ALWAYS TAKES CARE OF HIM	FAMILY PERSON THAT ALWAYS TAKES CARE OF HIM	NOT INDICATED
He is accompanied by a person from the family that always takes care of him	14	Escort	3.77%	9.43%	36.51%	36.51%	15.88%

Variable number 12, which concerns the level of cooperation as estimated by the detector, was associated with other questions in the questionnaire (variables 1 to 11); Table 2 shows that these correlations are positive for all variables.

Table 3 shows the results of the linear correlation analysis between all of the variables; it shows a strong correlation between variable numbers 8, 9 and 10 with 1, 2 and 5. Furthermore, variable 1 is correlated with 2, 3, 5, 9, 10, and 11.

Questionnaires should undergo evaluation of their properties before they are relied on for making decisions.

The standardized results use the values of the items after they are standardized to a standard deviation of 1. This can be especially helpful if the items have very different ranges. In the current application, all of the items are on the same scale so there is not much difference

between the raw and the standardized values. In this example, Cronbach's alpha is 0.77 (standardized result), which meet the a priori criterion of  $0.90 \geq \alpha \geq 0.70$ .

A good analysis of test items should take the whole test into consideration. Table 2 shows what the alpha would be if that variable was deleted. This approach helps you to spot the bad apple (if any) and retain the good one. In our framework all variables have reasonable alpha.

From the convergent/discriminant analysis, several points appear. The overall picture is presented in Table 3, which shows variables from 1 to 11. They are related to each other. It is possible to conclude that:

- Variable 1 (the patient is able to orient himself in space and time) is significantly correlated with variable 2 (communicative ability), variable 3 (self-control) and variable 5 (sociability). Variable 1 is correlated with visual and

TABLE 2

RELIABILITY IF AN ITEM IS DROPPED		
INTERNAL RELIABILITY ANALYSIS WITH DELETED VARIABLE		
	RAW ALPHA	STANDARDIZED ALPHA
Var 1	0.76	0.74
Var 2	0.75	0.73
Var 3	0.80	0.77
Var 4	0.80	0.78
Var 5	0.76	0.73
Var 6	0.80	0.78
Var 7	0.80	0.78
Var 8	0.79	0.77
Var 9	0.76	0.74
Var 10	0.77	0.75
Var 11	0.75	0.73
Var 12	0.76	0.73
Var 13	0.78	0.75
Var 14	0.80	0.78

TABLE 3

ANALYSIS OF LINEAR CORRELATION BETWEEN THE VARIABLE COLLABORATION (VAR 12) AND THE OTHER (FROM VARIABLE NUMBER 1 TO NUMBER 11)											
FIELD	NEUROPSYCHOLOGICAL			EMOTIONAL-AFFECTIVE				AUTONOMY-MOBILITY			
P<0.05	Var1	Var2	Var3	Var4	Var5	Var6	Var7	Var8	Var9	Var10	Var11
Var12	0.49	0.53	0.52	0.10	0.54	0.24	0.08	0.16	0.43	0.23	0.49

auditory skills as well and it is less but still significantly related to oral functional skills.

- The negative correlation with variable 6 confirms the quality of the instrument. A person skilled in the previous areas is inclined not to express aggressive behaviours.
- Variable 2 has significant positive correlations with variables 1, 5, 9 (view) and 11 (feeding). Variable 2 was also positively correlated with variable 10 (hearing).
- Variable 3 presented a positive correlation with variable 1 and had also the highest negative value (-11) with variable 8 (mobility). This is interesting because one would expect good control during waiting times in patients with motor deficits. Probably, the capacity to wait is a reflection of immobility caused by physical problems. By contrast, patients without physical problems can openly express their anxiety and intolerance during waiting times.
- Variable 4 (equanimity) was not significantly linked with any other variable, except a weak positive correlation with variable 8.
- Variable 5 was strongly correlated with variables 1, 2, 9, 10 and 11. This confirms that sensory and motor abilities may affect the mood of the person.
- Variable 6 (problematic behaviour) indicated only a slight positive relationship with variable 7 (extroversion). Aggressiveness and bad mood could be connected. A person with problematic behaviours feels often heavy and sad. Many studies showed important correlations between aggressive behaviours and the perceptions of the person who takes care of them [9, 10].
- Variables 7 and 8 (autonomy) did not have any significant correlations. There was a strong correlation between variables 8 and 11; motor skill was linked with feeding autonomy.
- Variables 9, 10 and 11 were strongly correlated each other and with other variables as well.

## DISCUSSION

A person that can not differentiate his behaviours in relation to situations and other people presents significant problems in receiving and remembering information.

The variable “guidance” shows that people with difficulties in placing themselves in space and time are marked by deficiencies in attention and memory. These limits may be a serious obstruction during dental treatments, as it can be assumed that the patient may not be able to psychologically prepare himself for stressful situations.

A very low score could suggest, for example, a need to amend rules and intervention times by providing shorter and more frequent meetings.

The marks obtained by tested people indicated that more than 60% of the patients may be treated with routine dental management.

The distribution analysis by age group shows that young people have more cognitive deficits. This suggests that the belief that adult patients are more difficult may be false.

The question regarding communications aims to identify functional abilities in processing information. Communication is indispensable for the management of dental treatment, the dental setting, pain and weariness tolerance and the endurance of unusual postures. Communication is an essential prerequisite to cooperation. When the patient does not possess functional communication, he can not receive or elaborate information.

The lack of waiting times could involve cognitive aspects as well as emotional ones, such as fear and anxiety of the unknown.

If a person is not ready to endure pauses, it will be difficult to achieve collaboration. Variable number 2 does not offer many operative indications. Related to other variables, however, it has a significant prominence on the profile of the patient.

A generic question about the “humour of the person” resulted in the collection of generic data. An especially peaceful person could live a particular moment without the detector knowing anything simply by the means of a questionnaire. If the patient has a placid personality, the response could focus more on character than the current situation. The question concerning variable number 4 is associated with the moment and must be interpreted in terms of behaviour.

An isolated and non-social person might

refuse a particular situation such as the dental environment. In such a setting, many potentially negative feelings can be experienced. Dental treatment occurs in a closed room, with a possible overload of sensory information (e.g., the smell of medicines, unusual flavours in the mouth, abnormal muscular tension in the face, unusual posture, sounds associated with pain and proximity and contact with foreign persons). In the “sociability” variable, 60% of the sample showed a high level of sociability; a sociable person shows curiosity and interest in these contexts as well.

People with disabilities may often have communicative problems or disruptive personalities that are hardly detected. Additionally, old age leads to expressions and reactions of intolerance linked to loss of emotional and cognitive functions, a process known as “senile dementia”. Recording aggressive behaviour, as in variable number 6, may help to prevent conditions that may determine a behavioural episode.

The variable “extroversion” represents a further question about the “mood state”. Asking if a person is peaceful or sad or asking whether he can manage waiting could investigate the same issue. It is important to know if the patient is able to hear, see, move and/or manage oral muscles.

The demand for independence could be important because 84% of the sample was concentrated in two extremes (total need of assistance and completely autonomous).

65% of the sample needed assistance (i.e., had motor problems).

Knowing the patient’s visual functionality may help to create a better dental setting for the patient. For example, while a person with a visual deficiency can prepare for the anaesthesia injection during its preparation, a sightless person will instead react to the event only when the needle is already in contact with the mucosa. This condition could result in muscle tension, a lack of cooperation and mistrust. These considerations can also be applied to hearing capacity.

Another important topic is information regarding chewing and the buccal capacity. A person that does not chew may have a hypotonic mouth and less dental health, that is a liability during treatment regarding the position of the tongue and decreased willingness to open the mouth. This information may affect the programme and treatment times.

The variable 12 assesses the collaboration level and it is the subjective opinion of the compiler. It has little significance because the terms are absolutely generic, however, if such responses are identified in line with other ones, it is possible to use them as a litmus test to confirm the consistency of the instrument.

The question about “previous dental experiences” intends to emphasise environmental problems and trouble getting in touch with other people. A total of 23 people out of 63 had visited the dentist at least once and reported negative experiences.

Variable 14 provided interesting information about the relationship between the attendants and patients. The data collected indicate that 37% arrived to the dental surgery appointment accompanied by a caregiver, but he is not significant person to the patient.

Through the multivariate linear correlation analysis (Table 3, Table 4), suitabilities and inconsistencies existing within the questionnaire were analyzed to evaluate relationships between the various items proposed.

The variables that were excluded from the correlation were age, sex, provenance, previous experience in a dental office and characteristics of the attendant. These variables were not directly associated with the personal characteristics of the subjects.

The analysis shows that there is a correlation between the collaboration level indicated by the compiler and the first three variables (guidance, communication and emotions). Therefore, in order to understand how much the patient can recognise the environment and people, the capacity for functional communication and good self-control may be a good indicator of the level of cooperation.

The information obtained for the social-relational field was interesting. There were only a few significant values except variable 5 (sociability), that measured socialization and extroversion skills. It seems that collaboration involves the possession of this ability, without affecting aggressive behaviours or empathy. In fact, even an introverted person or one with behavioural problems can display good cooperation levels.

The impact of behavioural problems is more serious if they are linked to cognitive abilities (e.g., motivation) and conditioned from certain social and environmental conditions.

Certainly, it is not possible to exclude the influence of intellectual deficits on behaviour,

TABLE 4

ANALYSIS OF LINEAR CORRELATION BETWEEN VARIABLES FROM NUMBER 1 TO NUMBER 11											
P<0.05	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7	VAR8	VAR9	VAR10	VAR11
VAR1	1.00	<b>0.52</b>	<b>0.44</b>	0.20	<b>0.68</b>	-0.08	0.03	0.26	<b>0.64</b>	<b>0.65</b>	<b>0.53</b>
VAR2	<b>0.52</b>	1.00	0.31	0.05	<b>0.51</b>	0.17	0.12	0.25	<b>0.64</b>	<b>0.47</b>	<b>0.54</b>
VAR3	<b>0.44</b>	0.31	1.00	-0.02	0.33	0.05	0.01	-0.11	0.30	0.13	0.24
VAR4	0.20	0.05	-0.02	1.00	0.30	-0.10	0.21	0.36	-0.04	0.24	0.21
VAR5	<b>0.68</b>	<b>0.51</b>	0.33	0.30	1.00	0.12	0.13	0.24	0.50	<b>0.54</b>	0.51
VAR6	-0.08	0.17	0.05	-0.10	0.12	1.00	0.33	0.19	0.10	-0.06	0.23
VAR7	0.03	0.12	0.01	0.21	0.13	0.33	1.00	0.15	0.03	0.22	0.22
VAR8	0.26	0.25	-0.11	0.36	0.24	0.19	0.15	1.00	0.33	0.13	<b>0.57</b>
VAR9	<b>0.64</b>	<b>0.64</b>	0.30	-0.04	<b>0.50</b>	0.10	0.03	0.33	1.00	<b>0.57</b>	<b>0.56</b>
VAR10	<b>0.65</b>	<b>0.47</b>	0.13	0.24	<b>0.54</b>	-0.06	0.22	0.13	<b>0.57</b>	1.00	0.30
VAR11	<b>0.53</b>	<b>0.54</b>	0.24	0.21	<b>0.51</b>	0.23	0.22	<b>0.57</b>	<b>0.56</b>	0.30	1.00

as there is a correlation that is both linear and positive, although weak, in nature.

About the third group of variables associated with autonomy and physical function, positive correlations were obtained. Cooperative ability is influenced by more visual and oral skills (variable 9 and 11) rather than auditory and motor skills. Therefore, information about the auditory and motor deficits may be used to organize the operating environment. Knowledge of the patient's visual or oral functional deficits may be useful in determining the objectives of the treatment.

The choice of items seems to be appropriate, as a linear and positive correlation appears. It may be useful to exclude certain items from the questionnaire, specifically those that were considered less significant (variables 4, 6, 7 and 8 ). Items 4, 6, 7 and 8 offered vague and unimportant information about the detection of collaboration levels in disabled patients.

The confirmed variables were 1, 2, 5, 9, 10 and 11.

The final questionnaire will be composed of ten items (Table 5), including variable 12 (complier evaluation of the level of patient cooperation), variable 13 (previous dental experiences) and variable 14 (attendant).

They were considered important in assessing the level of cooperation for a patient although they had not been compared with each other. In fact, "previous dental experiences" and "attendant" can affect the patient-operator report independently from the characteristics of the disabled people.

The most important limit of the

questionnaire is the standardized schema detection, because it is equal for all the patients and it should be administered equally to them. The questionnaire may obscure the real aim of the work: the creation of a tool revealing a collaborativeness profile, not a mere arithmetic table where you can place the patient.

The use of this instrument, routinely, could facilitate the daily ambulatory activity, especially the planning of care in patients that do not show, at the first visit, little or no collaboration. These patients are, nowadays, addressed to fixed routes (repeated appointments for evaluation, often unsuccessful attempts, general anesthesia) that are economically and socially expensive, so it is necessary a preliminary accurate evaluation.

The questionnaire could allow this evaluation and the choice of the better educational/therapeutic course.

## CONCLUSIONS

Finally, the study was able to identify an instrument with the following requirements:

- a description of the main determinants of a patient's level of collaboration;
- an easy, brief tool, fast to be administered;
- ability to promote a personalised dental treatment;
- a way of communication between various staff members;
- a response to organizational needs.

The instrument could provide recognition

TABLE 5

FINAL QUESTIONNAIRE VERSION				
QUESTIONS	1	2	3	4
N. 1	He does not recognize people and environments	Sometimes he does not recognize environments and people	Sometimes he confuses in time and space	He knows the date of today and the place where is situated
N. 2	He does not notify or uses a non functional behaviour	He communicates with the behaviour only some needs	He notifies in summary with words or gestures	He notifies using an appropriate way
N. 3	He can not wait	He has very short waiting times	The waiting time depends on the humor	He has a good behaviour during the waiting time
N. 4	He is isolated and does not socialise with people he knows	He does not socialise with outside persons	Sometimes he is little sociable and avoids the other people	He is just as good with the other
N. 5	He does not see	He only see shadows	He distinguishes the faces of persons	He sees well (with lenses or glasses too)
N. 6	He can not hear	He hears only some words said too loud or very strong noises	He hears well when it talks aloud	He has not auditory problems (with prosthesis too)
N. 7	He is not independent to eat, he does not chew	He is not independent to eat but chews	He eats and chews chopped food	He eats and chews in an autonomous way
N. 8	He does not cooperate	He collaborates little	Sometimes he collaborates	He collaborates
N. 9	He is accompanied by a person who does not know and not takes care of him	He is accompanied by a person of his family that does not take care of him	He is accompanied by a person that usually takes care of him	He is accompanied by a person of his family that takes care of him
N. 10	Previous negative dental experience	No previous negative dental experience	He referred previous negative dental experience	Previous positive dental experience

of skills strongly related to the collaboration profile, to take into account areas such as cognitive, emotional, motor and autonomy.

The statistically validated questionnaire seems to be appropriate in achieving the objectives as described.

The instrument, called Cooperation Level Evaluation Questionnaire (CLEQ), will be subjected to further research, also increasing the number of patients, to confirm its validity and utility.

## References

- [1] Kobe FH, Mulick JA, Rash TA. Nonambulatory persons with profound mental retardation: physical, developmental, and behavioral characteristics. *Res Dev Disabil.* 1994; 15(6): 413-23
- [2] O'Grady R, Talkington L. Selected behavioural concomitants of profound mental retardation. In: *The Profoundly Mentally Retarded*, vol. II; 1977; eds. Cleland C. and Schwartz J. Austin, TX: Western Research Conference
- [3] Cleland C, Clark C. Sensory deprivation and aberrant

- behavior among idiots. *American Journal of Mental Deficiency* 1966; 71: 213-35
- [4] Kerr M. Primary health care for people with an intellectual disability. *Journal of Intellectual Disability Research* 1997; 41: 363-4
- [5] Martin DM, Roy A, Wells MB, Lewis J. Health gains through screening. Users' and carers' perspectives of healthcare: developing primary health care services for people with an intellectual disability. *Journal of Intellectual and Developmental Disability* 1997; 22: 241-9
- [6] Bartoli A. L'autosufficienza dell'anziano. La versione italiana della scala di valutazione della funzionalità geriatrica di H. Grauer. *Prospettive Sociali e Sanitarie* 1990; 22: 4-9
- [7] Nisi A, Ceccarani P. Le convenzioni educative. *Rivista HD*, n° 56 1993. Tecnoscuola, Italy.
- [8] Marzocchi GM, Cornoldi C. Una scala di facile uso per la rilevazione dei comportamenti problematici dei bambini con deficit di attenzione e iperattività. *Psicologia Clinica dello Sviluppo* 2000; n° 1: 43-63.
- [9] Jahoda A, Wanless LK. Knowing you: the interpersonal perceptions of staff towards aggressive individuals with to moderate intellectual disabilities. *Journal of Intellectual Disability Research* 2005; 49: 544-51
- [10] Purcell M, Morris I, McConkey R. Staff perceptions of the communicative competence of adult persons with intellectual disabilities. *The British Journal of Developmental Disabilities* 1999. Vol. 45, Part 1, 88:16-25
- [11] Green S, Lissitz R, Malik S. Limitations of coefficient alpha as an index of test unimodality. *Educational Psychological Measurement* 1977; 37: 827-38

