A Moroccan study of the Alarm Distress Baby (ADBB) scale and a validation of René Spitz's hypothesis on the causes of 'hospitalism' and 'anaclitic depression'

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Abstract
Social withdrawal behaviour in infants is a key indicator of child distress and a risk factor for later pathologies. The present study provides results from a Moroccan study of the ADBB scale applied to two populations that were very different in terms of early separation experiences: babies living in a children's home (n=46) and babies raised by their families (n=56). These 102 infants were assessed using the ADBB scale during routine paediatric check-ups between the ages of 2 and 18 months. Social withdrawal behaviour was significantly more marked among infants raised in a children's home than among infants raised by their family, and more so among boys than among girls.
This study comprising a control group confirmed the validity of Spitz's description, which placed social withdrawal at the centre of anaclitic depression and of the causes of hospitalism, and attributed this withdrawal to the infants' early and prolonged separation from their caregivers.
The use of the scale may therefore remain recommended for systematic detection during routine paediatric check-ups or for the follow-up of children at risk, to enable appropriate early interventions to take place.

Keywords: ADBB scale, social withdrawal, infant, anaclitic depression

Introduction

In 1945, the émigré Spitz published a landmark article in which he suggested that babies cared for in institution suffered from "hospitalism" and failure to thrive[1] (see Rowold [2] 2019, for a review of the changing interpretations of hospitalism in an international context, 1900-1945). Spitz was indeed among the first psychoanalysts to focus on the direct observation of infants deprived of parental care. In particular, he was the first to use filming for his well-known description of anaclitic depression[3]. Despite the fact that the basic physical and medical needs of these children who had been separated from their mother had been met, they were gradually sinking into symptoms such as apathy, sadness, anxiety and withdrawal, a state for which Spitz suggested the term anaclitic depression, though differentiating it from depression in older children and adults[3]. Spitz's description was based on a comparison between infants in a foundling home in Mexico and infants from a prison nursery in the US. He was greatly helped by Katharina 's Wolff first draft of infant development tests 'baby tests', but as Wolff moved to Yale, Spitz was devoid of her methodological and statistical abilities[2]. Therefore, Spitz's proposals were received with criticism, as it lacked methodological back-up and particularly a control group of non-institutionalized infants. How could social withdrawal behaviour be solely attributed to separation without any comparison with a control group of children without a history of separation, and without removing other possible factors of withdrawal (premature birth, genetic disorders)?

Social withdrawal behaviour in infants

From the very first day following birth, infants have the ability to make contact with the social world around them. They express their social and relational skills through motor skills, facial expressions, sucking, visual contact, vocalisation and their ability to draw other people's attention[4,5]. Infants are born with a consciousness of other people's subjective states, they readily try and interact with them and they do so from birth[6]. Physiologically, infants use withdrawal of a few seconds to regulate their emotions[7,8]

More prolonged reactions of social withdrawal can be observed in babies as a defence mechanism against long-lasting and repeated violations of expected social interactions, particularly when babies are subjected to a drastic change in the synchronisation of interactions and failure to heal.

More or less prolonged reactions of withdrawal in children can been triggered by organic pathologies, sensory disorders, long-lasting acute pain, autistic disorders and long-lasting, major changes in the relationship with the usual caregiver, such as in the case of post-natal depression.

Human beings are biologically programmed to respond to dangerous, potentially stressful situations by withdrawal, resistance or freezing[9,10].

Selma Fraiberg[10], based on her experiment with young vulnerable parents, gave a description freezing reactions, a behaviour that babies use as an early defence mechanism when they experience strong feelings of powerlessness, which can appear as early as the age of 3 months. Defensive mechanisms in babies, of the relational breakdown or avoidance type, such as avoiding someone's gaze, avoiding relational contact and isolation, are used as a strategy to escape from interaction failures[5,9,10].

Since a long-lasting state of social withdrawal has consequences on the range and quality of children's inter-subjective experiences and on different neurodevelopmental dimensions[9], it is important to be able to detect social withdrawal, even in the most unobtrusive forms.

Longitudinal studies [5,11] have reported that infants, in whom long-lasting social withdrawal behaviour had been

detected, were exposed to more emotion regulation disorders at the age of 3 and to more behavioural disorders of the aggressive type at the age of 5.

The Alarm Distress Baby scale (ADBB) was developed to screen for signs of early social withdrawal in babies; it has been the subject of several validations and applications in different countries since its first validation in 2001[12], (See Guedeney & al, for a review of recent, controlled validation studies) [7,13,14,]

The objective of this study consisted in assessing social withdrawal using the Alarm Distress Baby scale (ADBB) in a Moroccan context by comparing two contrasted populations of infants with and without prolonged separation from their attachment figures. In effect, this is a Moroccan validation study of the ADBB scale.

Objectives

The main objective of this study consisted in validating and making available a specific tool for screening for social withdrawal using the ADBB scale[13] to infant healthcare professionals in Morocco working in child protection institutions and primary healthcare centres (PHCC). The aim was to integrate this scale systematically into paediatric consultations and to provide the possibility, after assessment and validation of the scale, of screening for early risk indicators in view of early interventions. The secondary objective was to validate Spitz's initial description of anaclitic depression and his hypothesis on the relational cause of hospitalism, using a control group of children who had not been separated from their families and to measure the difference in the mean levels of social withdrawal among infants raised in a children's home and those raised by their own family.

II. Material and Methods

Population:

The study was carried out between 2017 and 2019 in two different institutions: a child protection institution for abandoned children and a primary child healthcare centre. The study was approved by the research ethics committee of Rabat University medical and pharmacy faculties. The sample included 102 infants divided into two groups: the "**separated" group**, or **SG** (n=46) and the **"non-separated"** group or **NSG** (n=56).

The infants recruited for the NSG came from families whose social-economic background was middle to low class. The infants in the SG were either infants abandoned by their parents because of a drastic lack of financial resources (11%) or because the parents had lost their parental authority (4%), or they were children of single mothers (85%) who had given up their baby for adoption at birth to a child protection institution or abandoned them in public places or hospitals.

The mothers' mean age at the time of the babies' assessment was 27.4 years for the NSG and 19.3 years for the SG. For both groups, the study only focused on healthy and non-premature babies.

The ADBB scale

The ADBB scale was used as an assessment tool for social withdrawal.

The scale includes 8 items:

1) Facial Expression (FE): Assessment of any reduction in facial expressiveness.
2) Eye Contact (EC): Assessment of any reduction in visual contact.
3) General Level of Activity (GLA): Assessment of reduced activity in the head, torso and limbs, without taking hand and finger activity into account.
4) Self-Stimulating Gestures (SSG): Assessment of the frequency with which infants play with their own body.
5) Vocalisations (V): Assessment of any reduction in vocalisations expressing

pleasure (cooing, laughter, babbling, baby talk, high-pitch squeaks of enjoyment) and displeasure, anxiety or pain (screaming, moaning, crying)

6) Briskness of Response to Stimulation (BRS): Assessment of any reduction in the briskness of reaction to stimulation, whether pleasant or unpleasant, during examination.
7) Relationship with the observer (R); Assessment of any reduction in the ability of the child to interact with the observer.
8) Attraction (A): Ability to draw attention (the effort the observer has to make to keep his/her attention centred on the baby).

The scale provides a total score from 0 to 32, with higher scores reflecting more serious signs of social withdrawal. Each item is assessed from 0 to 4, from absence of abnormal behaviour (0) to clearly or drastically abnormal behaviour (4). A total score of 5 or more is considered as optimal for the detection of social withdrawal in a baby; a score between 5 and 10 indicates a baby is slightly withdrawn, and a score above 10 indicates a child with clear withdrawal behaviour. The ADBB scale has demonstrated satisfactory psychometric properties in all the cultural contexts studied. The first French validation found good metrological qualities concerning inter-rater agreement[6] (r=0.84), specificity (r=0.78) and sensitivity (r=0.83). A score of 5 and over was retained here for the detection of social withdrawal [13].

Procedure

The study began in 2016 with work by our inter-disciplinary team composed of a neuropsychologist, a psychotherapist and two paediatricians. In order to study the different items of the ADBB and their different scores, the team first carried out pilot studies in different primary healthcare centres and were thus trained on how to use the ADBB assessment scale. The scale was easy to use in clinical practice and its administration lasted only about 10 minutes.

The assessment was then carried out on both groups by the same investigator, a paediatrician who had trained to use the ADBB scale during consultations. ADBB assessments in primary healthcare centres took place during routine clinical check-ups or during vaccination appointments. The staff in charge of triage prepared the children in the NSG for assessment, observing the inclusion criteria (healthy children). The families then were asked to sign informed consent; they did not receive any income or gratuity in exchange for their participation.

The infants participating in the study who came from the adoption institution (SG) were first of all assessed to be in good health with no associated disorders by the paediatrician in the institution. Prior authorisation for this research was delivered by the Moroccan League for Child Protection (LMPE), as it represented a potential benefit for the children.

Authorisation to film could not be obtained, as parents refused to have their children filmed, even when shown the ethics committee's prior authorisation. ADBB scoring was conducted straight after a paediatric examination. All babies presenting signs of withdrawal (score of 5 or over) were reassessed in the days following the examination to confirm the score obtained, which was then retained for analysis. The children with a confirmed level of withdrawal were referred to specialists for a diagnosis and possible follow-up care.

Statistical analysis

Observed values are expressed by their median (m) and median absolute deviation (mad). Statistical analyses were performed with R software (Vienna, Austria. URL http://www.R-project.org/, 2017). Implementing Cronbach's alpha coefficient, Pearson's correlation coefficient, Mann-Whitney and Fischer

exact test as required the type was1 error fixed at 0.05.

III. Results

One hundred and two infants were retained for analysis, including 63 boys (62%) and 39 girls (38%). The imbalance between boys and girls was very significant among groups and mainly due to only 9 boys in the SG group (Fischer Exact Test, $p<5.10^{-4)}$.

The children's median age ranged from 2 months to 19 months at the time of the ADBB assessment, m = 7.75 (mad = 4.45). The median age of the separated children 4 months (mad=2.97). The median age of the non-separated children was 8 months (mad=5.93). In terms of age group, 52% of children were assessed with the ADBB scale between 2 and 6 months, 28% between 6 and 12 months and 20% between 12 and 19 months (See Annex, Table 4).

The mean age at assessment differed very little between the two genders with an median of 4.77 (mad=4.45) for female gender (n=39) and 6 (mad=4.45) for male gender (n=63) (p=0.65).

Breakdown of the ADBB score across the sample

Global ADBB scores ranged from 0 to 18. Score under 5 was found for 84% for the overall sample (Figure 1).

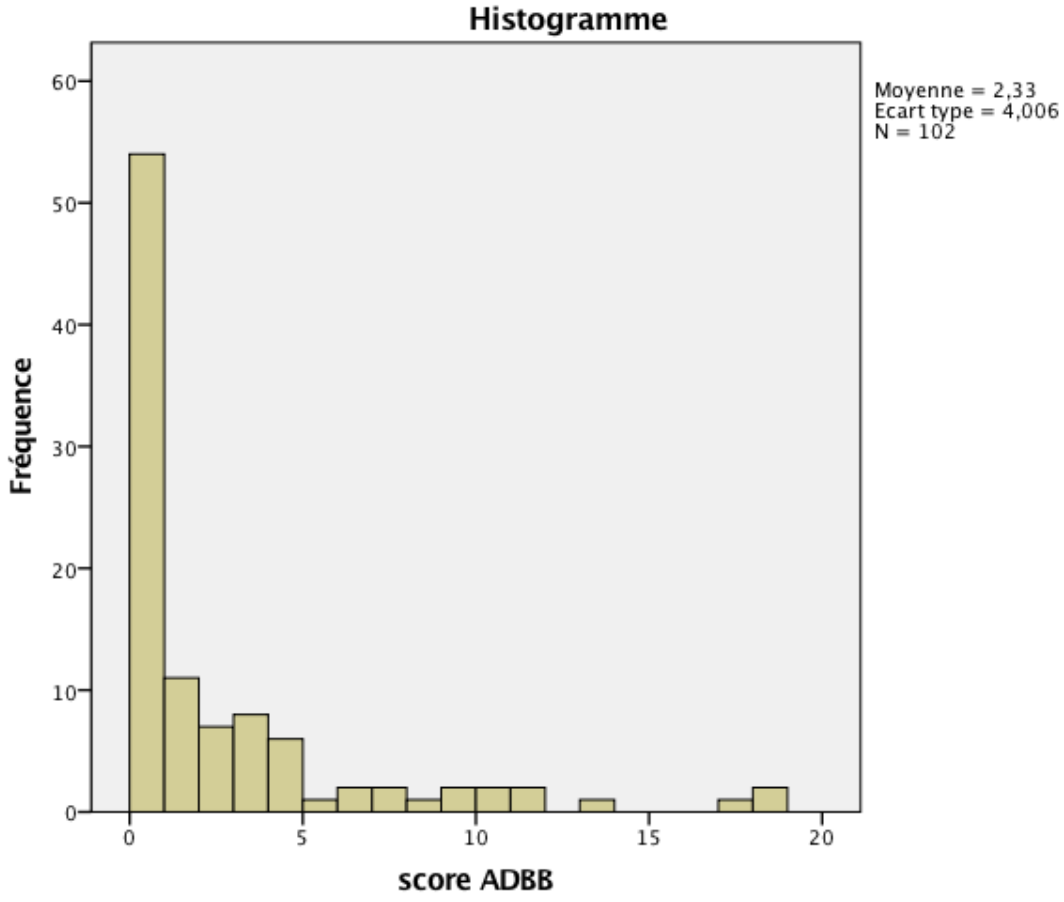


Figure1: ADBB global scores for 102 infants

Scores were generally higher in the SG group (m= 2.5, mad= 3.7, see Annex, Graph 3) than in the NSG (m=0, mad=0, see Annex, Graph 2). This difference was significant ($p < 10^{-5}$) A score over 10 was noted for 8% in the SG (Table 1).

Table 1: Breakdown of the ADBB score per age group at assessment

Score value		AGE AT ASSESSMENT			Total N	Percentage
		2-6	6-12	12-18		
< 5	SG	21	4	6	31	
	NSG	24	19	12	55	
	Total S/NS	45	23	18	86	**84.3%**
5-10	SG	3	3	1	7	
	NSG	1	0	0	1	
	Total S/NS	**4**	**3**	**1**	**8**	**8%**
10-18	SG	5	2	1	8	8%
	NSG	0	0	0	0	
	TOTAL S/NS	**9**	**5**	**2**	**16**	**16%**
		25	19	12	56	
	TOTAL	54	28	20	102	

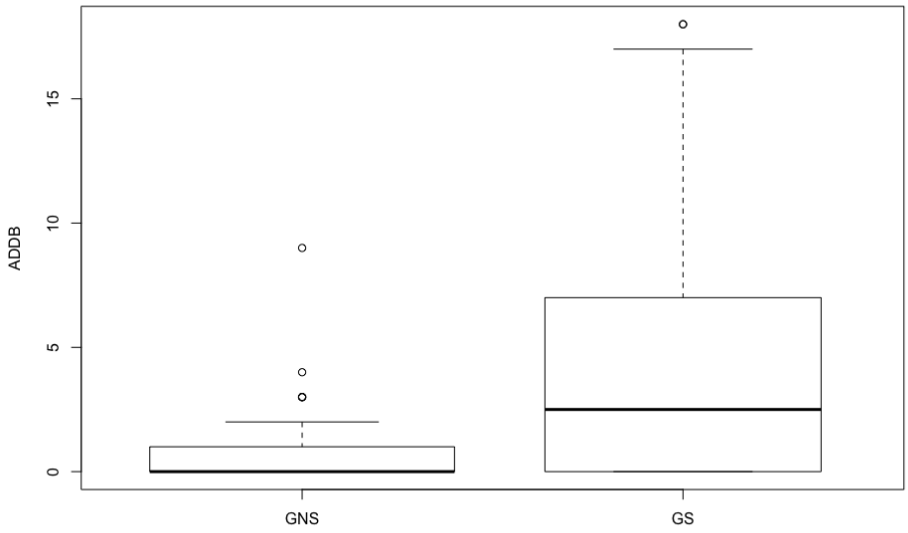


Figure 2: Total ADBB score for NSG and SG

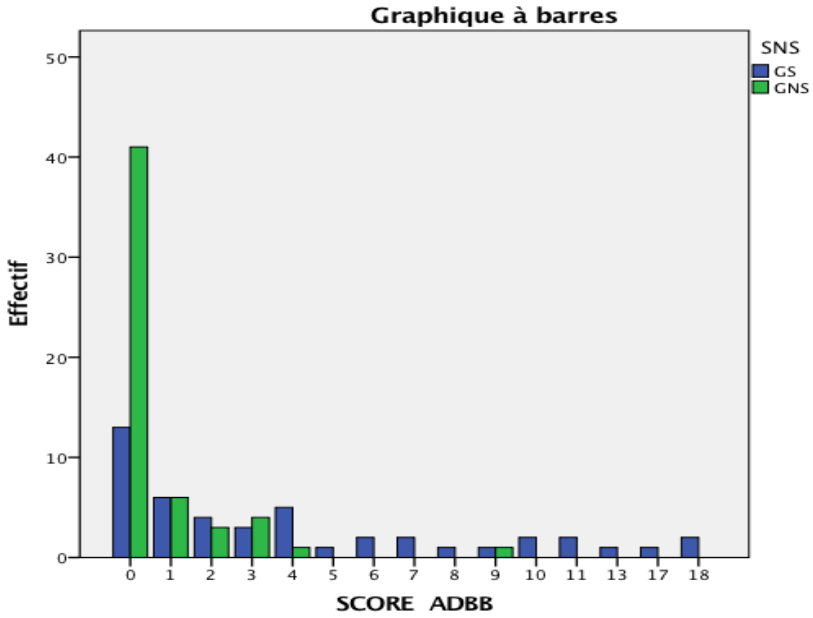


Figure 3: Total ADBB score for SG and NSG

The ADBB score for the NSG: most infants from the NSG (54%) did not show any withdrawal, expect for one baby showing marked social withdrawal with a score of 9 (NSG global score=0.71) (Graph 2).

The study of the age of admission into the children's home found a percentage of 70% of the children taken in before the age of 1 month, 20% between 1 and 6 months and 11% at over 6 months (See Annex, Graph 4).

The study on the ADBB score depending on the age at admission showed that among the 70% (n=32) of children taken in before 1 month, 50% among the children in the SG (n=23) did not show any withdrawal and 19% (n=9) did (score over 5).

Among the 19% (N=9) of children taken in between the 1 month and 6 months, only two of the nine children showed withdrawal, whilst four out of five children (n=5) who were taken in between 6 and 18 months (11%) and assessed one month after admission showed social withdrawal; the only child taken in at over 6 months and who presented no sign of social withdrawal was assessed the day after admission (i.e. there was no hospitalism latency). These results suggest that when separation occurs at a later age, withdrawal behaviour is more significant.

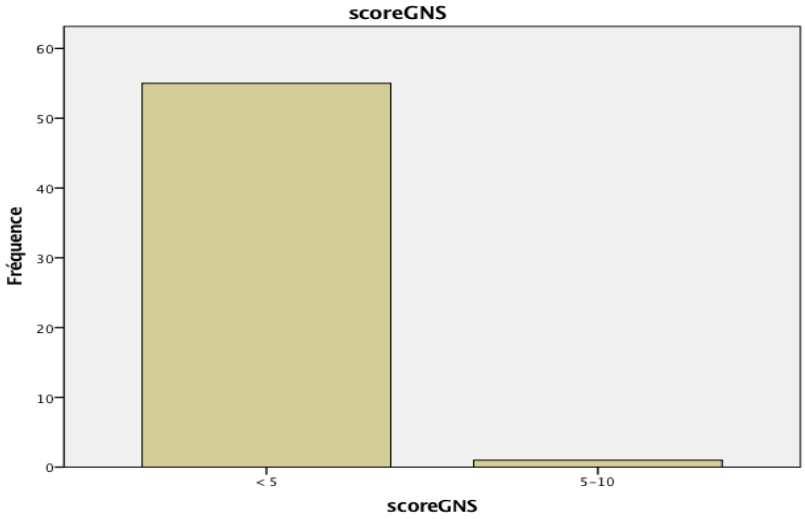
Table 3: ADBB score for the SG according to gender and age at admission

Age range at admission Percentage (P)			Gender		Total: N	Percentage (P) of age range
			M	F		
0 -1month **P : 70%**	score	0-5	19	4	23	<u>0- 6 month</u> score ≥ 5 27%
		5-10	4	0	4	
		≥10	4	1	5	
	Total		27	5	**32**	
1- 6 months **P : 20%**	score	0-5	5	2	7	
		5-10	1	0	1	
		≥ 10	1	0	1	
	Total		7	2	**9**	

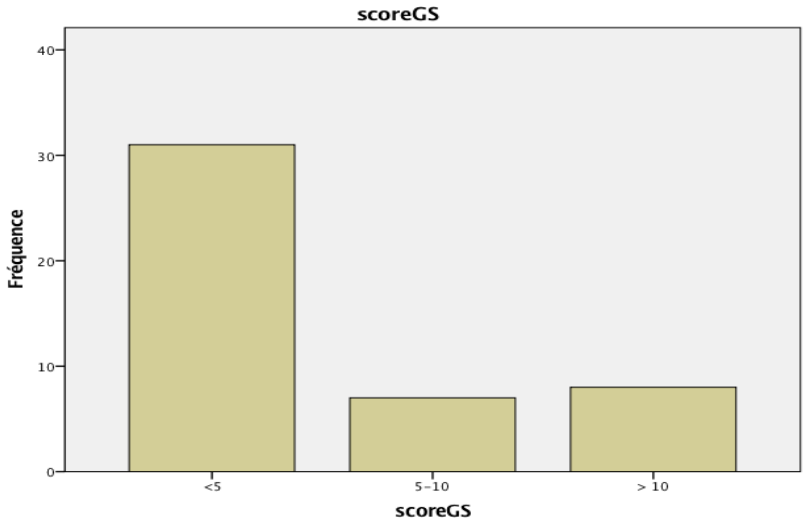
6-18 months **P : 10%**	score	0-5	0	1	1	<u>6-18 month</u> score ≥ 5 80%
		5-10	1	1	2	
		≥ 10	2	0	2	
	Total		3	2	**5**	
Total	score	0-5	24	7	31	score ≥ 5 33%
		5-10	6	1	7	
		≥ 10	7	1	8	
	Total		37	9	46	

90% from the SG taken in before the age of 6 months, 27% among them exhibited social withdrawal (score over 5). Whilst among the 10% of the SG taken in between 6 months and 18 months, 80% showed a social withdrawal, which shows the sustained withdrawal in the SG, is more evident in children admitted between 6 and 18 months (80 %) than children admitted before the first 6 months (27%),

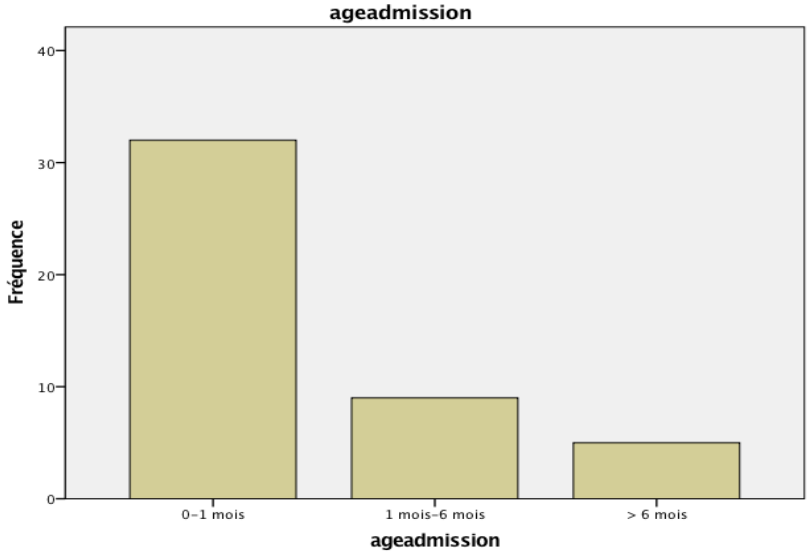
No significant difference concerning relational withdrawal between the two sexes of the GS (35% boys, 22% girls).



Graph 1: ADBB total score for the "Non-Separated Group" NSG



Graph 2: ADBB score for the "separated Group" (SG)



Graph 3: Age at admission for the "Separated Group" SG

Properties of the ADBB scale
Cronbach alpha coefficient reached 0.87 (Table 1)

Table 1: Cronbach's coefficient

Cronbach's alpha	Cronbach's alpha based on standardised items	Number of items
.872	.875	8

Table 2: Statistics for the overall items

	Mean for the scale in case of one item deleted	Variance of the scale in case of one deleted item	Complete correlation of the corrected items	Square of the multiple correlation	Cronbach's alpha in case of item deletion
Facial expression	2.010	10.683	.839	.766	.831
Eye Contact	2.078	11.855	.700	.623	.850
General Level of Activity	1.990	10.663	.797	.715	.836
Self Stimulation Gestures	1.716	11.176	.504	.308	.879
Vocalisation	2.010	10.307	.770	.684	.839
Briskness of Response	2.147	12.463	.664	.581	.856
Relationship	2.216	13.022	.506	.413	.868
Attraction	2.098	13.594	.357	.229	.879

Discussion

Our hypothesis forecast a score for of 5 or more in the SG, higher on mean than that of the NSG. Indeed, 16% of the study population showed marked social withdrawal, more particularly in the SG. This is a significant result with a more marked, prolonged social withdrawal in the SG, however only one infant aged 2 in the NSG showed marked social withdrawal with a score of 9. According to procedure, the infant was assessed two weeks later, and the score was still over 5, and then he was referred to a specialist for expert advice. Now he aged 15 months is currently being monitored for suspicion of Pervasive Developmental Disorder (PDD), which is currently under investigation.

Moreover, the ADBB scale showed good reliability, with a Cronbach's alpha coefficient of 0.87, a mean score of 2.32, a variance of 15.03 (SD = 3.87) and strong positive correlations between the different items.

At the time of the social withdrawal assessment, the children's median age ranged from 2 months to 19 months, m = 7.75 (mad = 4.45).

While, the mean age at assessment differed very little between the two genders. Boys represented 62% and girls 38%. (The imbalance between boys and girls was very significant among groups and mainly due to only 9 boys in the SG ($p < 5.10^{-4}$).

The male predominance in the SG can be noted, possibly explained by the fact that girls are generally more in demand for adoption in institution than boys (Abandoned children in Morocco 2010. UNICEF)[15].

A male predominance had already been observed by Guedeney et al.[5], in a sample of the general population evaluated at 14 months in a cross-sectional study in a screening center of the French social insurance body.

The mean total ADBB score was 2.32 (SD = 3.87). A score less than 5 was found for 84% of the overall sample. Scores were generally higher in the SG group (m =2.5, mad = 3.7) than in the NSG (m = 0, mad = 0). This difference was significant ($p <10^{-5}$). A score greater than 10 was noted in 8% in the SG.

Concerning age of admission to the children's home, it was found that among the 90% from the SG taken in before the age of 6 months, 27% among them exhibited social withdrawal (score over 5). Whilst among the 10% of the SG taken in between 6 months and 18 months, 80% showed a social withdrawal, which shows the sustained withdrawal in the SG, is more evident in children admitted between 6 and 18 months (80 %) than children admitted before the first 6 months (27%), this agrees with the observations of Spitz[16] highlighting, in children separated from their mother at an age ranging from 6 to 9 months, a state of depression anaclitic with protest, despair and drop in acquisitions.

In the present study, the time lapse between admission and assessment enabled 50% of the children under one month old in the SG to have an interaction with their caregivers, and an affective, interpersonal and interactive relationship with their caregivers, thus making their socio-emotional development almost normal.

The quality of social functioning in the institution, highlights the interactive and apparent influence of one of the special caregivers - or lack thereof - on the emotional and social development of children, even when the basic physical and health needs seem fulfilled.

In a Portuguese study on children placed in an institution, Baptista et al.[17], showed that better social and emotional functioning among children, greater sensitivity to care by caregivers and improved quality in individualized care could reduce the probability of children developing problems of social relationships and withdrawal; they concluded that the experiencing a relationship with a particular carer in an institution provided opportunities for emotional interactions and

for exploring the environment. However, the absence of interpersonal interaction and the influence of various factors specific to the child, in particular temperament, could interfere with the child's development, and especially with their ability to regulate their emotions and behavior. This was the case for 19.3% of the under one month old children in the SG, who exhibited social withdrawal with scores over 5. No significant difference concerning relational withdrawal between the two sexes of the GS.

In the present study, many factors were not considered and not studied, such as the quality of the childcare environment, the interaction with the caregivers, and individual factors specific to each child according to the gender and his vulnerability. Future research should be of a longitudinal design and take into consideration the socio-emotional background of the child and his family especially the mother before his arrival in an institution and assess the social withdrawal behavior of the child at the time of admission to the institution and at subsequent times, thus making it possible to predict change over time.

Additionally, more other studies are therefore necessary to continue the Moroccan validation of the instrument.

Limitations and strengths of the study

The present study presents several limitations, one of which was the fact that study was research-action based, i.e. an exploratory study, with no possibility of control over the groups and variables. Information regarding healthcare quality in the institutions was not considered, and neither was the evaluation of the children's temperament. The assessment of social withdrawal was carried out by only one investigator, who had taught herself to administer the scale, with no specific training and no checking of how reliable her scoring was. Furthermore, the researcher was not blind to which group, "separated" or "non-separated", the babies belonged, which could have been possible had a video been made available for each assessment. However, it was not possible to obtain consent from the parents or the authorities to use videos, a tool that is still limited in its use for child care professionals in Morocco. A further limitation was the absence of accurate matching between the two groups in terms of age at assessment and parity between girls and boys.

One of the main strengths of the study was that it had two much contrasted groups concerning the experience of prolonged separation from the parents, and a non-clinical control group from the Moroccan general population. Another strong point in the study was that is had a single assessor for the whole sample, with long-standing experience in paediatrics and in assessing child development. A 15% global incidence of withdrawal above the threshold score of 5 in the non-clinical group from the general population was similar to that found elsewhere and is therefore a good basis for a valid assessment of social withdrawal. The two groups were identical in terms of the absence of prematurity, sensory disorders and known genetic disorders. Another strong point was that further assessment was systematically carried out a week later whenever the total score was higher than the threshold score of 5.

Conclusion

This is the first study to have been carried out in paediatric clinical practice in a Moroccan context, using the alarm distress baby (ADBB) scale as a detection tool for prolonged social withdrawal in infants. The study enabled social withdrawal to be detected in 15.6% of children from a general population, which is similar to the rates found in comparable populations elsewhere. The rate was higher after an early separation, with a global rate of 4.33 (SD= 4.005) and global scores ranging from 0 to 18.

Detecting marked social withdrawal using the ADBB scale in the institutionalised infant population of the study was of great interest despite the small size of the sample. Indeed, babies who are brought to orphanages tend to leave early because there is a permanent movement in the adoption process. It would seem primordial to assess social withdrawal among the infants as soon as they are brought in, and to reassess them after a certain time to see whether or not a change in withdrawal behaviour has occurred after receiving care.

This Moroccan study, with two much contrasted groups in terms of early separation, demonstrated the virtues of the ADBB scale; it is a useful tool for professionals, either for routine follow-up or for the follow-up of populations at risk. By its comparison of social withdrawal between the two groups, the study confirmed the validity of Spitz's clinical intuition, describing social withdrawal as central to the description of anaclitic depression.

Further studies will be able to take the limitations of this study into account to assess social withdrawal in children's behaviour at the time of their admission to a children's home and at a later stage, according to the care provided. The metrological qualities of the ADBB scale in the Moroccan population should be confirmed by a study on a larger sample including babies of different ages.

Take home: This first validation of the Alarm Distress baby scale in Morocco was made in two much contrasted samples, one with infants in orphanage, and the other in a primary child healthcare centre. The scale demonstrated good psychometric properties.

By its comparison of social withdrawal between the two groups, the study confirmed the validity of Spitz's clinical intuition, describing social withdrawal as central to the description of anaclitic depression and hospitalism being caused by lack of relationship, rather than by health issues.

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